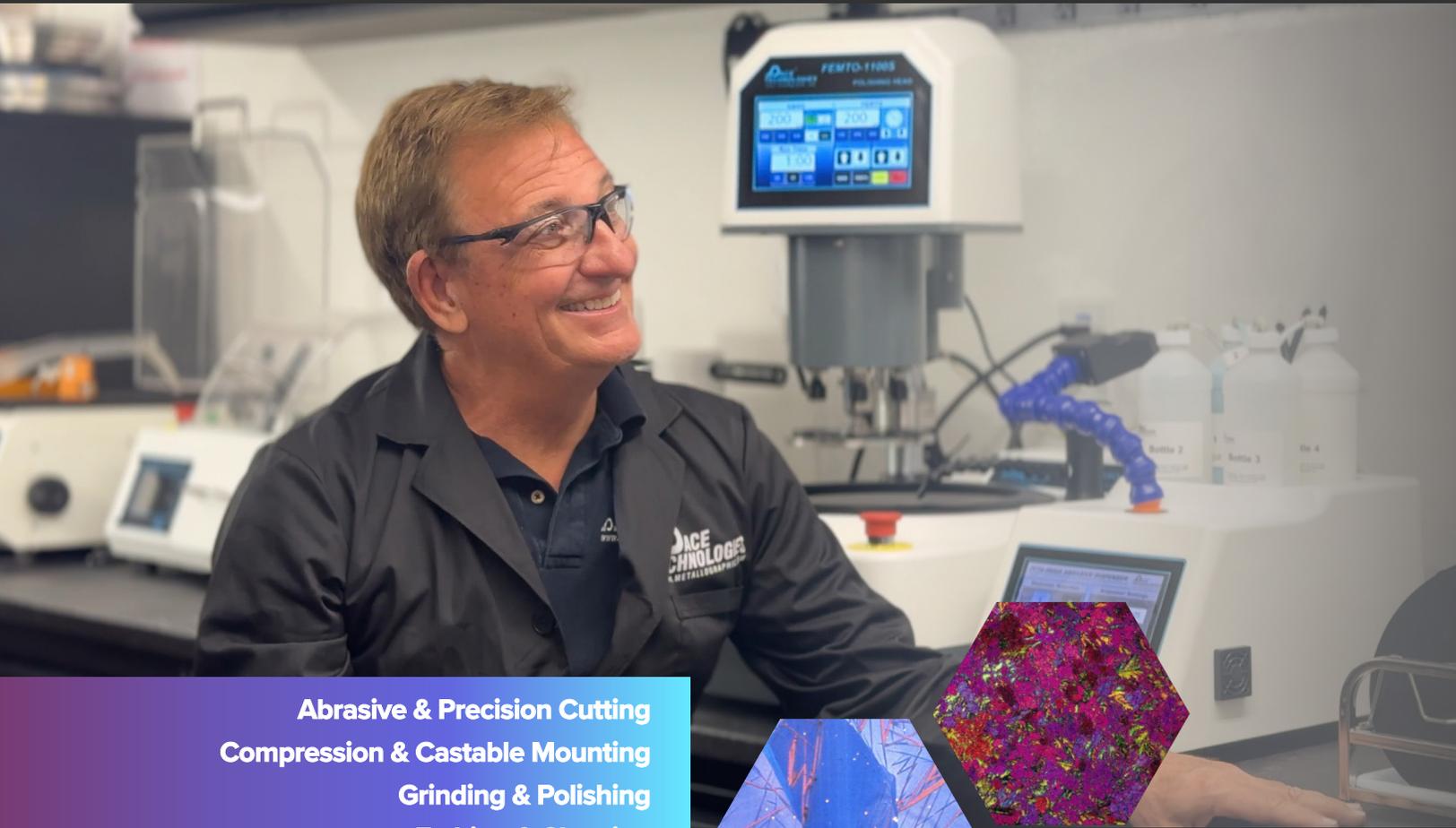
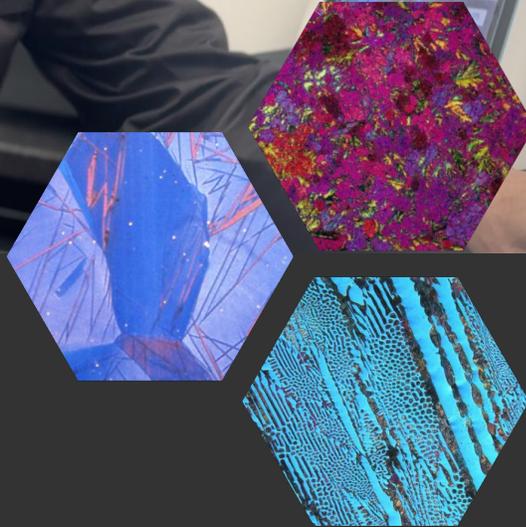


PRODUCT CATALOG

METALLOGRAPHIC EQUIPMENT & CONSUMABLES



Abrasive & Precision Cutting
Compression & Castable Mounting
Grinding & Polishing
Etching & Cleaning
Microscopy & Analysis
Hardness Testing
Lab Furniture





MESSAGE FROM THE CEO

Donald C. Zipperian, PhD

It is my privilege to introduce the next generation of innovation and excellence at PACE Technologies.

For more than twenty-five years, PACE Technologies has stood at the forefront of metallographic advancement. We have been guided by a single purpose: to elevate quality through precision, innovation, and service. From our earliest beginnings, we've built a reputation for pushing boundaries and delivering solutions that combine cutting-edge performance with exceptional value.

This latest generation of equipment reflects that same enduring commitment. Designed with enhanced flexibility, precision, and control, these metallographic systems empower our customers to achieve new levels of consistency and confidence in their sample preparation. Behind every product stands our growing team of experts, ready to share their knowledge and ensure your success at every step.

Our investment in vertical integration has strengthened our promise of reliability. By producing our grinding papers, diamond suspensions, castable mounting systems and lubricants in-house, we maintain complete oversight of quality, timeliness, and cost efficiency, ensuring that every PACE product meets the standards our customers expect and deserve.

At PACE Technologies, we believe that quality matters, not only in what we make, but in how we serve. It is this belief that continues to drive our pursuit of excellence and defines the trust our customers place in us.

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For pricing, delivery, or order status:

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Fax: +1 (520) 882-6599
Email: pace@metallographic.com

For product details, procedures, etchants, Safety Data Sheets (SDS), and troubleshooting guidelines, visit: www.metallographic.com

For quotes:

Phone: +1 (520) 882-6598
Email: sales@metallographic.com

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ABRASIVE SECTIONING

Manual MEGA Abrasive Cutter Options

MODEL	Blade Diameter	Wheel Feed	Manual Y-Table	Standard Voltage Options	Max Motor Power
MEGA-M250S	10-inch (250 mm)	Yes	n.a.	208V/380V/480V, 3φ	3 hp (2.2KW) (asynchronous motor)
MEGA-T250S	10-inch (250 mm)	Yes	Yes	208V/380V, 3φ	5.8 hp (4.5 KW) (servo motor)
MEGA-T300S	12-inch (305 mm)	Yes	Yes	208V/380V, 3φ 380V/480V, 3φ	5.8 hp (4.5 KW) 10 hp (7.5 KW) (servo motor)
MEGA-T350S	14-inch (355 mm)	Yes	Yes	380V/480V, 3φ 480V, 3φ	10 hp (7.5 KW) 20 hp (15 KW) (servo motor)
MEGA-T400S	16-inch (405 mm)	Yes	Yes	480V, 3φ	20 hp (15 KW) (servo motor)

Automated MEGA Abrasive Cutter Options

MODEL	Blade Diameter	Auto/Manual Y-Table	Auto X-Table	Standard Voltage Options	Max Motor Power
MEGA-T300A	12-inch (305 mm)	Yes	Optional	208V/380V, 3φ 380/480V, 3φ	5.8 hp (4.5 KW) 10 hp (7.5 KW) (servo motor)
MEGA-T350A	14-inch (355 mm)	Yes	Optional	380V/480V, 3φ 480V, 3φ	10 hp (7.5 KW) 20 hp (15 KW) (servo motor)
MEGA-T400A	16-inch (405 mm)	Yes	Optional	480V, 3φ	20 hp (15 KW) (servo motor)

Options:

- ◆ Choose the machine that accommodates your preferred blade diameter
- ◆ Add an automated X-axis Table for maximum flexibility on cuts
- ◆ Choose between voltage options to provide the exact amount of power you need

2 year warranty
Limited Warranty

Benefits:

- ◆ Constant torque variable speed Servo Motor (3-phase)
- ◆ Manual or automated Y-Axis table feed
- ◆ X-axis tables have automated X-axis control
- ◆ Programming options for constant feed rate or constant motor load for better control
- ◆ Twin t-slotted stainless steel table
- ◆ Electronic braking system
- ◆ Variable speed and constant torque cutting on the MEGA Abrasive Saws help eliminate smeared metal and burrs when sectioning ductile materials

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ABRASIVE CUTTER OVERVIEW



CE Machinery Directive 2006/42/EC
2014/35/ EU Low Voltage Directive
2014/30/EU Electromagnetic Compatibility Directive

METALLOGRAPHIC ABRASIVE CUTTERS



MEGA-M250S

10-inch MANUAL
Metallographic Abrasive Cutter

- Manual wheel feed cutting
- Economical
- 3-phase asynchronous motor (208V/380V/480V), 3Φ
- Variable speed cutting (1000-3000 rpm)
- T-slot table fixturing



MEGA-M250S Control Panel

Recommended Vises:



MEGA-M250S

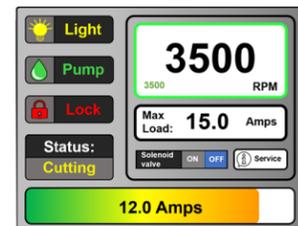
Recommended vises may vary depending on sample specifications; alternative vises are available.



MEGA-T250S

10-inch MANUAL
Metallographic Abrasive Cutter

- Manual table / wheel feed cutting
- High torque servo motor (4.5 KW)
- Variable speed cutting (1500-3500 rpm)
- T-slot table fixturing
- Non-Touch screen control (selector switch)



MEGA-T250S Control Screen

Recommended Vises:



MEGA-T250S

10-inch Metallographic Abrasive Cutter

Model Name	MEGA-M250S	MEGA-T250S
Cut-off blade size	10-inch (~250 mm)	10-inch (~250 mm)
Arbor size	32 mm (1.25-inch)	32 mm (1.25-inch)
Cutting capacity (H X D)	Maximum 2 x 4-inch (50 x 100 mm)	Maximum 2 x 8-inch (50 x 200 mm)
Cutting capacity	Maximum diameter 2.5-inch (65 mm)	Maximum diameter 3-inch (75 mm)
Wheel feed	Manual	Manual
Table feed	n.a.	Manual
Y pulse feed	n.a.	Manual
Y constant feed	n.a.	Manual
Vertical movement (z-axis)	3.25-inch (82 mm)	3.9-inch (100 mm)
Table feed movement (y-axis)	n.a.	3.3-inch (84 mm)
Table movement (x-axis) for parallel cuts	n.a.	n.a.
T-slotted table dimensions	9.75 x 9-inch (250 x 230 mm)	11 x 18.25-inch (280 x 470 mm)
T-slotted width	0.5-inch (50 mm)	0.5-inch (50 mm)
Operation	Manual	Manual
Cooling unit	14 gallons (53 liters)	14 gallons (53 liters)
Motor power	3 phase motor speed - 2.2 KW (3 hp)	Constant torque variable speed servo motor - 4.5 KW (5.8 hp)
Motor speed	Variable (1000-3000 rpm)	Variable (1500-3500 rpm)
Electrical specification	208V / 380V / 480V, 3φ (50/60 Hz)	208V / 380V, 3φ (50/60 Hz)
Cutting force (current settings)	Max 15 amps	Max 15 amps
Dimensions (WxDxH)	Hood closed: 30 x 26 x 26.5-inch (762 x 660 x 673 mm) Hood open: 30 x 26 x 38.5-inch (762 x 660 x 979 mm)	Hood closed: 35 x 32 x 26-inch (889 x 812 x 660 mm) Hood open: 35 x 32 x 37.4-inch (889 x 812 x 949 mm)
Weight	240 lbs (110 kg)	375 lbs (170 kg)
Cutter Support Bench (optional)	MEGA-T2-BENCH	MEGA-T2-BENCH
Catalog Number	MEGA-M250S	MEGA-T250S

2 year warranty
Limited Warranty

Benefits:

- ◆ Wheel and table feed controlled cutting
- ◆ Cutting capacity up to 3-inches (75 mm) solid stock sample using 10-inch (250 mm) blade
- ◆ Variable speed control to maximize blade performance
- ◆ High leverage handle for better control
- ◆ Variable speed motors
- ◆ Twin t-slotted stainless steel table
- ◆ Electronic braking system

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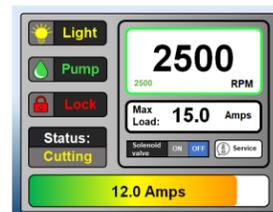
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MEGA-T300S

12-inch MANUAL Metallographic Abrasive Cutter

- Manual table / wheel feed cutting
- High torque servo motor
- Variable speed cutting (1500-3500 rpm)
- T-slot table fixturing
- Non-Touch screen control (selector switch)



MEGA-T300S Control Screen

Recommended Vises:



MEGA-T300S

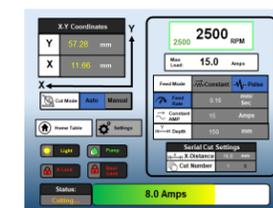
Recommended vises may vary depending on sample specifications; alternative vises are available.



MEGA-T300A

12-inch AUTOMATED Metallographic Abrasive Cutter

- Automated table feed and Manual table / wheel feed cutting
- Auto / Manual y-axis feed (optional Auto X-axis feed)
- High torque servo motor
- Variable speed cutting (1500-3500 rpm)
- Constant feed or constant cutting force control
- T-slot table fixturing
- Non-Touch screen control (selector switch)



MEGA-T300A Control Screen

Recommended Vises:



MEGA-T300A

12-inch Metallographic Abrasive Cutter

Model Name	MEGA-T300S	MEGA-T300A
Cut-off blade size	12-inch (305 mm)	12-inch (305 mm)
Operation	Manual	Auto / Manual
Screen	Non-touch	Non-touch
Arbor size	32 mm (1.25-inch)	32 mm (1.25-inch)
Cutting capacity (H X D)	Maximum 3 x 8-inch (70 x 200 mm)	Maximum 3 x 8-inch (70 x 200 mm)
Cutting capacity	Maximum diameter 4-inch (100 mm)	Maximum diameter 4-inch (100 mm)
Wheel feed	Manual	Manual
Table feed	Manual	Auto / Manual
Y pulse feed	Manual	Auto
Y-axis table feed - Range - Speed (feed rate)	7-inch (180 mm) n.a.	7-inch (180 mm) 0.04 to 0.07-inch/second (1-10 mm/second)
X-axis table feed - Range - Speed (feed rate)	n.a. n.a.	Optional: 1.8-inch (45 mm) 0.04 to 0.07-inch/second (1-2 mm/second)
Vertical movement (z-axis)	7-inch (175 mm)	7-inch (175 mm)
T-slotted table dimensions	11 x 18.25-inch (280 x 470 mm)	11 x 18.25-inch (280 x 470 mm)
T-slotted width	0.5-inch (50 mm)	0.5-inch (50 mm)
Cooling unit	14 gallons (53 liters)	14 gallons (53 liters)
Motor power	Constant torque variable speed Servo Motor, 3φ - 4.5 KW (5.8 hp) 208V, 380V - 7.5 KW (10 hp) 380V, 480V	Constant torque variable speed Servo Motor, 3φ - 4.5 KW (5.8 hp) 208V, 380V - 7.5 KW (10 hp) 380V, 480V
Motor speed	Variable (1500-3500 rpm)	Variable (1500-3500 rpm)
Cutting force (current settings)	3-15 amps (208/380V) 3-25 amps (380/480V)	3-15 amps (208/380V) 3-25 amps (380/480V)
Electrical specification	208V / 380V or 380V / 480V, 3φ (50/60 Hz)	208V / 380V or 380V / 480V, 3φ (50/60 Hz)
Dimensions (WxDxH)	Hood closed: 47.5 x 43 x 30-inch (1206.5 x 1092 x 762 mm) Hood open: 47.5 x 43 x 47.2-inch (1206.5 x 1092 x 1199 mm)	Hood closed: 47.5 x 43 x 30-inch (1206.5 x 1092 x 762 mm) Hood open: 47.5 x 43 x 47.2-inch (1206.5 x 1092 x 1199 mm)
Weight	500-550 lbs (230-250 kg)	500-550 lbs (230-250 kg)
Cutter Support Bench (optional)	MEGA-T3-BENCH	MEGA-T3-BENCH
Catalog Number	MEGA-T300S	MEGA-T300A

2 year warranty
Limited Warranty

Benefits:

- Wheel and table feed controlled cutting
- Cutting capacity up to 4-inches (110 mm)
- Variable speed control to maximize blade performance
- High leverage handle for better control
- Constant torque variable speed Servo Motor
- Amperage controlled cutting force to minimize burrs and smearing
- 4.5 KW (5.8 hp) 208V, 380V 7.5 KW (10 hp) 380V, 480V
- Twin t-slotted stainless steel table
- Electronic braking system

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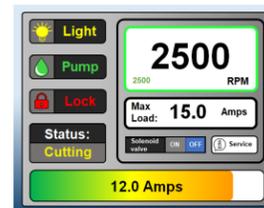
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MEGA-T350S

14-inch MANUAL
Metallographic Abrasive Cutter

- Manual table / wheel feed cutting
- High torque servo motor
- Variable speed cutting (1000-3000 rpm)
- T-slot table fixturing
- Non-Touch screen control (selector switch)



MEGA-T350S Control Screen

Recommended Vises:



MEGA-T350S

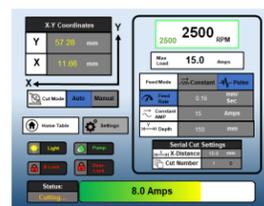
Recommended vises may vary depending on sample specifications; alternative vises are available.



MEGA-T350A

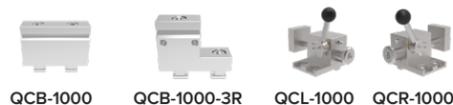
14-inch AUTOMATED
Metallographic Abrasive Cutter

- Automated table feed and Manual table / wheel feed cutting
- Auto / Manual y-axis feed (optional Auto X-axis feed)
- High torque servo motor
- Variable speed cutting (1000-3000 rpm)
- Constant feed or constant cutting force control
- T-slot table fixturing
- Non-Touch screen control (selector switch)



MEGA-T350A Control Screen

Recommended Vises:



MEGA-T350A

14-inch Metallographic Abrasive Cutter

Model Name	MEGA-T350S	MEGA-T350A
Cut-off blade size	14-inch (355 mm)	14-inch (355 mm)
Operation	Manual	Auto / Manual
Screen	Non-touch	Non-touch
Arbor size	32 mm (1.25-inch)	32 mm (1.25-inch)
Cutting capacity (H X D)	Maximum 3 x 6-inch (70 x 150 mm)	Maximum 3 x 6-inch (70 x 150 mm)
Cutting capacity	Maximum diameter 4.5-inch (115 mm)	Maximum diameter 4.5-inch (115 mm)
Wheel feed	Manual	Manual
Table feed	Manual	Auto / Manual
Y pulse feed	Manual	Auto
Y-axis table feed - Range - Speed (feed rate)	7-inch (180 mm) n.a.	7-inch (180 mm) 0.04 to 0.20-inch/second (1-10 mm/second)
X-axis table feed - Range - Speed (feed rate)	n.a. n.a.	OPTIONAL: 1.8-inch (45 mm) 0.04 to 0.07-inch/second (1-2 mm/second)
Vertical movement (z-axis)	3-inch (75 mm)	5.5inch (140 mm)
T-slotted table dimensions (WxD)	28 x 16-inch (710 x 400 mm)	28 x 16-inch (710 x 400 mm)
T-slotted width	0.5-inch (50 mm)	0.5-inch (50 mm)
Cooling unit	14 gallons (53 liters)	14 gallons (53 liters)
Motor power	Constant torque variable speed Servo Motor, 3φ - 7.5 KW (10 hp) 380V, 480V - 15 KW (20 hp) 480V	Constant torque variable speed Servo Motor, 3φ - 7.5 KW (10 hp) 380V, 480V - 15 KW (20 hp) 480V
Motor speed	Variable (1000-3000 rpm)	Variable (1000-3000 rpm)
Cutting force (current settings)	3-25 amps (380/480V)	3-25 amps (380/480V)
Electrical specification	380V or 480V, 3φ (50/60 Hz)	380V or 480V, 3φ (50/60 Hz)
Dimensions (WxDxH)	Hood closed: 47.5 x 43 x 63-inch (1206.5 x 1092 x 1600 mm) Hood open: 47.5 x 43 x 78-inch (1206.5 x 1092 x 1981 mm)	Hood closed: 47.5 x 43 x 63-inch (1206.5 x 1092 x 1600 mm) Hood open: 47.5 x 43 x 78-inch (1206.5 x 1092 x 1981 mm)
Weight	650-700 lbs (300-320 kg)	650-700 lbs (300-320 kg)
Catalog Number	MEGA-T350S	MEGA-T350A

CE Machinery Directive 2006/42/EC
2014/35/ EU Low Voltage Directive
2014/30/EU Electromagnetic Compatibility Directive

2 year warranty
Limited Warranty

Benefits:

- Wheel and table feed controlled cutting
- Cutting capacity up to 4.5 inches (115 mm)
- Variable speed control to maximize blade performance
- Constant torque variable speed Servo Motor
- Amperage controlled cutting force to minimize burrs and smearing
- 7.5 KW (10 hp) 380V, 480V
15 KW (20 hp) 480V
- Twin t-slotted stainless steel table
- Electronic braking system

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7.5 KW (10 hp) 3-phase servo motor

15 KW (20 hp) 480V 3-phase servo motor

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MEGA-T400S

MEGA-T400S

16-inch MANUAL Metallographic Abrasive Cutter

- Manual table / wheel feed cutting
- High torque servo motor
- Variable speed cutting (1000-3000 rpm)
- Wheel and table feed cutting
- T-slot table fixturing
- Touch screen control



MEGA-T400S Control Screen

Recommended Vises:



(2X) QCB-1000 QCL-1000 QCR-1000

Recommended vises may vary depending on sample specifications; alternative vises are available.

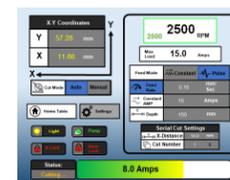


MEGA-T400A

MEGA-T400A

16-inch AUTOMATED Metallographic Abrasive Cutter

- Automated table feed and Manual table / wheel feed cutting
- Auto / Manual y-axis feed (optional Auto X-axis feed)
- High torque servo motor
- Variable speed cutting (1000-3000 rpm)
- Constant feed or constant cutting force control
- T-slot table fixturing
- Touch screen control



MEGA-T400A Control Screen

Recommended Vises:



(2X) QCB-1000 QCL-1000 QCR-1000

16-inch Metallographic Abrasive Cutter

Model Name	MEGA-T400S	MEGA-T400A
Cut-off blade size	16-inch (405 mm)	16-inch (405 mm)
Operation	Manual	Auto / Manual
Screen	Touch	Touch
Arbor size	32 mm (1.25-inch)	32 mm (1.25-inch)
Cutting capacity (H X D)	Maximum 3 x 6-inch (70 x 150 mm)	Maximum 3 x 6-inch (70 x 150 mm)
Cutting capacity	Maximum diameter 6-inch (150 mm)	Maximum diameter 6-inch (150 mm)
Wheel feed	Manual	Manual
Table feed	Manual	Auto / Manual
Y pulse feed	Manual	Auto
Y-axis table feed - Range - Speed (feed rate)	7-inch (180 mm) n.a.	7-inch (180 mm) 0.04 to 0.20-inch/second (1-10 mm/second)
X-axis table feed - Range - Speed (feed rate)	n.a. n.a.	OPTIONAL: 1.8-inch (45 mm) 0.04 to 0.07-inch/second (1-2 mm/second)
Vertical movement (z-axis)	5-inch (125 mm)	5-inch (125 mm)
T-slotted table dimensions	11 x 18.25-inch (280 x 470 mm)	11 x 18.25-inch (280 x 470 mm)
T-slotted width	0.5-inch (50 mm)	0.5-inch (50 mm)
Cooling unit	14 gallons (53 liters)	14 gallons (53 liters)
Motor power	Constant torque variable speed Servo Motor, 3φ -15 KW (20 hp) 480V	Constant torque variable speed Servo Motor, 3φ -15 KW (20 hp) 480V
Motor speed	Variable (1000-3000 rpm)	Variable (1000-3000 rpm)
Cutting force (current settings)	3-25 amps (480V)	3-25 amps (480V)
Electrical specification	480V, 3φ (50/60 Hz)	480V, 3φ (50/60 Hz)
Dimensions (WxDxH)	Hood closed: 46 x 45.5 x 66-inch (1168 x 1156 x 1676 mm) Hood open: 46 x 45.5 x 83-inch (1168 x 1156 x 2108 mm)	Hood closed: 46 x 45.5 x 66-inch (1168 x 1156 x 1676 mm) Hood open: 46 x 45.5 x 83-inch (1168 x 1156 x 2108 mm)
Weight	880-930 lbs (400-425 kg)	880-930 lbs (400-425 kg)
Catalog Number	MEGA-T400S	MEGA-T400A

CE Machinery Directive 2006/42/EC
2014/35/ EU Low Voltage Directive
2014/30/EU Electromagnetic Compatibility Directive

2 year warranty
Limited Warranty

Benefits:

- ◆ Touch screen control
- ◆ Wheel and table feed controlled cutting
- ◆ Cutting capacity up to 6 inches (150 mm)
- ◆ Variable speed control to maximize blade performance
- ◆ Constant torque variable speed Servo Motor
- ◆ Amperage controlled cutting force to minimize burrs and smearing
- ◆ 15 KW (20 hp) (480V -phase)
- ◆ Twin t-slotted stainless steel table
- ◆ Electronic braking system

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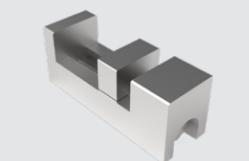


15 KW (20 hp) 480V 3-phase servo motor

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MEGA Accessories

Vertical Clamping Vise (2.8-inch / 71 mm) 	Vertical Clamping Vise (2.0-inch / 51 mm) 	Height Adapter for MG-E (2.25-inch / 57 mm) 	Arm Extension for MG-E (1.25-inch / 32 mm) 
Catalog no. MG-15	Catalog no. MG-E	Catalog no. MG-EH	Catalog no. MG-EX
MEGA Saddle Vise 	MEGA Fastener Vise 	Quick Release Clamping Vise (Left Hand) 	Quick Release Clamping Vise (Right Hand) 
Catalog no. MEGA-702	Catalog no. MEGA-711	Catalog no. QCL-1000-250 & QCL-1000	Catalog no. QCR-1000-250 & QCR-1000
Backstop Plate 	Shorter Backstop Plate 	Backstop Plate 	Shorter Backstop Plate 
Catalog no. QCB-1000	Catalog no. QCB-1000-250	Catalog no. QCB-1000-3R	Catalog no. QCB-1000-250R
2.5-inch Blade Flanges for MEGA-T250S 	3.5-inch Blade Flanges for MEGA-T300/350S 	5-inch Blade Flanges for MEGA-T400S 	
Catalog no. T250-CA-F	Catalog no. T350-CA-F	Catalog no. T400-CA-F	

Recommended Cutting Procedures:

- Select the appropriate abrasive blade based on abrasive type, bond, hardness, material properties, and cutter speed.
- Secure the specimen properly to prevent blade or specimen damage.
- Check coolant levels regularly and replace if low or excessively dirty to ensure optimal cooling and cutting performance.
- Adjust the abrasive cutter speed to 85-90% the maximum operating speed of the blade (M.O.S). This maximizes the abrasive blades cutting efficiency and allows the blade to wear more evenly.
- For automated cutting of softer ductile materials, use a lower cutting force. Controlled by setting the maximum motor amperage pull.
- Allow the abrasive blade to reach its operating speed before beginning the cut.
- Apply steady pressure or use a light pulsing action to achieve clean cuts, minimize blade wear, and maintain sample integrity.
- When cutting coated materials, position the specimen so the blade enters through the coating and exits through the base material, keeping the coating in compression and reducing damage.

Abrasive Cutting Fluid Recommendations

CUTTING FLUID	APPLICATION	RECOMMENDED DILUTION	CHANGING FREQUENCY
MAXCUT Cutting Fluid	As a replacement for competitors cutting fluids	25:1 (water)	50 cuts or weekly
MAXCUT2 Cutting Fluid with Anti-corrosion	Recommended for reducing corrosion in cutting chamber	25:1 (water)	50 cuts or weekly
MAXCUT Water Soluble Oil Cutting Fluid	Environmentally friendly, ideal for general cutting with good cooling and easy cleanup	20:1 (water)	50 cuts or weekly



Tips: Abrasive Cutter Care:

- ◆ Use clean/fresh MAXCUT cutting fluid; It should be changed weekly.
- ◆ Rinse and dry table and vises after use.
- ◆ When cutter is not in use open hood to prevent humidity build-up.
- ◆ If cutter will not be used for an extended period of time, spray table and vises with a water displacement oil such as WD40®.

Abrasive Cutting Fluids

PACE Product Name	Catalog Number	Qty
MAXCUT Abrasive Cutting Fluid (32 oz)	MAXCUT-1000-32	32 oz
MAXCUT Abrasive Cutting Fluid (1/2 gallon)	MAXCUT-1000-64	1/2 gallon
MAXCUT Abrasive Cutting Fluid (1 gallon)	MAXCUT-1000-128	1 gallon
MAXCUT Abrasive Cutting Fluid (5 gallons)	MAXCUT-1000-5G	5 gallons
MAXCUT2 Abrasive Cutting Fluid with Anti-corrosion Additive (32 oz)	MAXCUT2-1000-32	32 oz
MAXCUT2 Abrasive Cutting Fluid with Anti-corrosion Additive (1/2 gallon)	MAXCUT2-1000-64	1/2 gallon
MAXCUT2 Abrasive Cutting Fluid with Anti-corrosion Additive (1 gallon)	MAXCUT2-1000-128	1 gallon
MAXCUT2 Abrasive Cutting Fluid with Anti-corrosion Additive (5 gallons)	MAXCUT2-1000-5G	5 gallons
MAXCUT Water Soluble Oil Cutting Fluid (32 oz)	MAXCUT-OL1000-32	32 oz
MAXCUT Water Soluble Oil Cutting Fluid (1/2 gallon)	MAXCUT-OL1000-64	1/2 gallon
MAXCUT Water Soluble Oil Cutting Fluid (1 gallon)	MAXCUT-OL1000-128	1 gallon
MAXCUT Water Soluble Oil Cutting Fluid (5 gallons)	MAXCUT-OL1000-5G	5 gallons
Propylene Glycol Based Corrosion Inhibitor Additive (32 oz)	PCC-5000-32	32 oz

Abrasive Cutting Blades

10-inch (250 mm) MAXCUT Abrasive Blades (32 mm arbor)

Blade Usage	M.O.S.	Catalog Number	Qty
Soft non-ferrous materials (aluminum, brass, zinc, etc.)	3440	MAX-C250	10/box
Hard non-ferrous materials (titanium)	3440	MAX-C250	10/box
Soft steel	4500	MAX-E250	10/box
General purpose resin bonded blade	4580	MAX-D250	10/box
Nickel, Superalloys	4580	MAX-A250	10/box
Very hard heat treated and case hardened ferrous materials (>50 Rc)	3055	MAX-VHS2-250	10/box
Universal Thin Blade	4580	MAX-A250	10/box
General Industrial Blade	4500	MAX-I250	10/box
180 grit high concentration Diamond Abrasive Blade cutting wheel	6100	DMAX-250	each



10-inch MAX-E250 Abrasive Blade

14-inch (355 mm) MAXCUT Abrasive Blades (32 mm arbor)

Blade Usage	M.O.S.	Catalog Number	Qty
Soft non-ferrous materials (aluminum, brass, zinc, etc.)	2460	MAX-C350	10/box
Hard non-ferrous materials (titanium)	2460	MAX-C350	10/box
Soft steel	3200	MAX-E350	10/box
General purpose resin bonded blade	3275	MAX-D350	10/box
Nickel, Superalloys	2730	MAX-A350	10/box
Very hard heat treated and case hardened ferrous materials (>50 Rc)	2200	MAX-VHS2-350	10/box
Universal Thin Blade	2730	MAX-A350	10/box
General Industrial Blade	3200	MAX-I350	10/box
180 grit high concentration Diamond Abrasive Blade cutting wheel	4350	DMAX-350	each

12-inch (305 mm) MAXCUT Abrasive Blades (32 mm arbor)

Blade Usage	M.O.S.	Catalog Number	Qty
Soft non-ferrous materials (aluminum, brass, zinc, etc.)	3800	MAX-C300	10/box
Hard non-ferrous materials (titanium)	3440	MAX-C300	10/box
Soft steel	3800	MAX-E300	10/box
General purpose resin bonded blade	3820	MAX-D300	10/box
Nickel, Superalloys	3945	MAX-A300	10/box
Very hard ferrous materials (>50 Rc)	2550	MAX-VHS2-300	10/box
Universal Thin Blade	3945	MAX-A300	10/box
General Industrial Blade	3800	MAX-I300	10/box
180 grit high concentration Diamond Abrasive Blade cutting wheel	5000	DMAX-305	each

16-inch (405 mm) MAXCUT Abrasive Blades (32 mm arbor)

Blade Usage	M.O.S.	Catalog Number	Qty
Soft non-ferrous materials (aluminum, brass, zinc, etc.)	2390	MAX-C400	10/box
Hard non-ferrous materials (titanium)	2390	MAX-C400	10/box
Soft steel	3800	MAX-E400	10/box
General purpose resin bonded blade	3800	MAX-D400	10/box
Nickel, Superalloys	2860	MAX-A400	10/box
Very hard heat treated and case hardened ferrous materials (>50 Rc)	1925	MAX-VHS2-400	10/box
Universal Thin Blade	2860	MAX-A400	10/box
General Industrial Blade	3800	MAX-I400	10/box
180 grit high concentration Diamond Abrasive Blade cutting wheel	3800	DMAX-400	each



16-inch DMAX-400 Diamond Blade

BLADE RECOMMENDATIONS

APPLICATION	ADVANTAGE	DISADVANTAGE	BLADE COMPOSITION	RECOMMENDED BLADE
General cutting with universal thin resin / rubber bonded blades	Thin durable longer lasting blade for cutting most materials.	Rubber bonded blades can produce a burning rubber smell	Alumina resin-rubber bonded	MAX-A 
Hard non-ferrous metals (titanium, zirconium, etc.)	SiC abrasives are much more effective in cutting non-ferrous metals	Rubber bonded blades can produce a burning rubber smell	SiC / resin-rubber bonded	MAX-C 
General purpose blade for steels and ferrous metals	Resin bonded blades break down easily to expose fresh abrasives for cleaner cuts	Generally thicker blades with shorter working life	Alumina / resin bonded	MAX-D 
Soft non-ferrous metals (aluminum, brass, zinc, etc.)	Resin bonded blades break down easily to expose fresh abrasives for cleaner cuts	Generally thicker blades with shorter working life	Alumina / resin bonded	MAX-E 
Industrial general purpose reinforced blade	Lower cost, longer life resin bonded blades	Harder resin bond which may result in damaging or burning of the sample during aggressive cutting	Alumina / resin-bonded	MAX-I 
Heat treated and hardened steels	Specifically designed metallographic abrasive blades to reduce heat damage during sectioning	Resin bonded blades break down faster and therefore have shorter cutting life	Alumina / resin bonded	MAX-VHS2 
Non-metallic materials such as glass, minerals, ceramics and composites	Diamond Blades do not wear down like ceramic abrasives blades	Relatively more expensive	Diamond	DMAX 

Abrasive Blade Maximum Operating Speed (M.O.S.) (rpm)

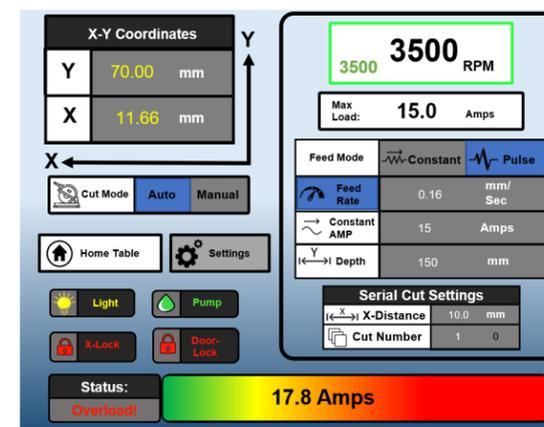
BLADE (M.O.S.) (rpm)	10-INCH	12-INCH	14-INCH	16-INCH
MAX-A	4580	3945	2730	2860
MAX-C	3440	3440	2460	2390
MAX-D	4580	3820	3275	3800
MAX-E	4500	3800	3200	3800
MAX-I	4500	3800	3200	3800
MAX-VHS2	3055	2550	2200	1925
DMAX	6100	5000	4350	3800

Abrasive Blade Thickness

BLADE THICKNESS	10-INCH (254 mm)	12-INCH (304.8 mm)	14-INCH (355.6 mm)	16-INCH (406.4 mm)
MAX-A	0.039 in (0.9906 mm)	0.055 in (1.397 mm)	0.063 in (1.600 mm)	0.090 in (2.286 mm)
MAX-C	0.059 in (1.499 mm)	0.078 in (1.981 mm)	0.078 in (1.981 mm)	0.100 in (2.54 mm)
MAX-D	0.059 in (1.499 mm)	0.078 in (1.981 mm)	0.078 in (1.981 mm)	0.100 in (2.54 mm)
MAX-E	0.059 in (1.499 mm)	0.078 in (1.981 mm)	0.078 in (1.981 mm)	0.100 in (2.54 mm)
MAX-I	0.059 in (1.499 mm)	0.078 in (1.981 mm)	0.078 in (1.981 mm)	0.100 in (2.54 mm)
MAX-VHS2	0.059 in (1.50 mm)	0.078 in (2.00 mm)	0.098 in (2.50 mm)	0.118 in (3.00 mm)
DMAX	0.059 in (1.499 mm)	0.060 in (1.524 mm)	0.060 in (4.524 mm)	0.075 in (1.905 mm)

TIP: Abrasive Cutting

- ◆ Properly fixture or clamp the sample/specimen
- ◆ Select the proper abrasive blade
- ◆ Set the correct cutting speed (the most efficient cutting speed is 85-90% the blade M.O.S.)
- ◆ Use appropriate cutting fluid and direct the flow to the cutting zone
- ◆ Cut specimen while monitoring motor amperage. The correct blade will minimize the current draw on the motor
- ◆ To minimize burring and smearing set maximum load to lower cutting amps
- ◆ After completion of the cutting operation, clean and dry the cutter fixtures, table and cutting chamber
- ◆ When not in use clean/dry and leave the hood in the open position to prevent corrosion. The use of a water displacement oil cutting fluids will also help prevent corrosion



MEGA-A Abrasive Cutter Control Screen



MEGA-T400 t-slot table



PICO-155S

PICO-155S

Precision Saw with Digital Control

- Precise gravity sample feed cutting
- 0.17 hp (125 W) Dynamic torque motor
- Microprocessor controlled with touch screen control
- Internal coolant pump
- Digital feedback speed control (200-1500 rpm)
- LCD interface display
- Highly reproducible, dependable and robust
- Easy to use



PICO-155S Control Screen

PICO-155P

Precision Saw with Analog Control

- Precise gravity sample feed cutting
- Internal coolant pump
- Digital feedback speed control (200-1500 rpm)
- LED speed display with analog control
- Highly reproducible, dependable and robust
- Flexible
- User friendly



PICO-155P Control Panel



PICO-155P

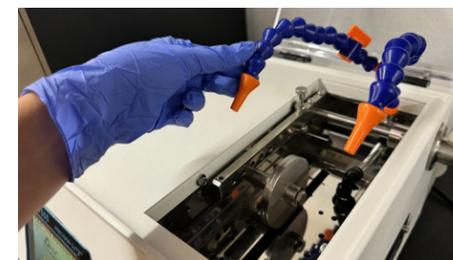
Low to Medium Speed Metallographic Precision Saws

Model Name	PICO-155S	PICO-155P
Control	5-inch touchscreen with digital LED display	Analog Buttons and Speed Control
Cutting capacity	Max. diameter 2-inch (50 mm)	Max. diameter 2-inch (50 mm)
Coolant	Dual nozzle with pump	Dual nozzle with pump
Blades	3-inch (75 mm) - 7-inch (175 mm)	3-inch (75 mm) - 7-inch (175 mm)
Arbor size	0.5-inch (12.7 mm)	0.5-inch (12.7 mm)
Variable Speed (rpm)	200-1500 rpm continuously adjustable with digital speed display	200-1500 rpm continuously adjustable with LED speed display
Cutting Load	0-1500 gram load	0-1500 gram load
Micrometer feed distance	0 to 1-inch (0-25 mm)	0 to 1-inch (0-25 mm)
Micrometer accuracy	2 microns	2 microns
Electrical Specification	110V/220V (50/60 Hz) (single phase)	110V/220V (50/60 Hz) (single phase)
Motor power	125W (24V)	125W (24V)
Dimensions (WxDxH)	Hood Closed: 19 x 23 x 14-inch (48 x 58 x 37 cm) Hood Open: 19 x 29 x 19-inch (48 x 74 x 48 cm)	Hood Closed: 19 x 23 x 14-inch (48 x 58 x 37 cm) Hood Open: 19 x 29 x 19-inch (48 x 74 x 48 cm)
Weight	66 lbs (30 kg)	66 lbs (30 kg)
Catalog Number	PICO-155S	PICO-155P

2 year warranty
Limited Warranty

Benefits:

- ◆ Microprocessor controlled (PICO-155S)
- ◆ 200-1500 rpm speeds
- ◆ Accepts 3-7 inch (75-175 mm) wafering blades
- ◆ Built-in digital micrometer
- ◆ Counter balanced loading
- ◆ Sliding weight gravity feed loading up to 1500 grams
- ◆ Built-in coolant system with internal pump
- ◆ Magnetic safety switch
- ◆ Emergency stop switch
- ◆ Optional cutting table attachment



PICO-155S Cooling Nozzles



PICO-155S YouTube Tutorial at youtube.com/@pacetechnologies

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or scan the QR code below



Machinery Directive 2006/42/EC
2014/35/ EU Low Voltage Directive
2014/30/EU Electromagnetic Compatibility Directive

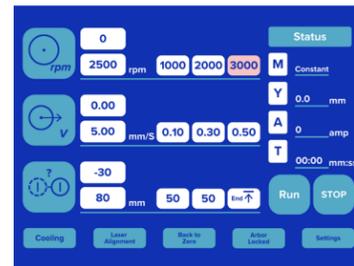


PICO-200A

PICO-200A

Automatic Precision Table Feed Saw

- Equipped with laser alignment for precise and repeatable cuts
- High speed saw (500-3000 rpm)
- Four cutting modes (constant, pulse, auto-adjust, and manual)
- 5-inch touchscreen with user-friendly interface
- Automatic and manual operation
- Supports wet and dry cutting
- Spacious table with 9.45-inch travel range
- Powerful 1200W (1.6 hp) motor
- Vises, backstops, and cutting guide are available



PICO-200A Control Screen

PICO-200S

Manual Precision Table Feed Saw

- High precision cutting of small samples
- Adjustable cutting speed (500-3000 rpm)
- Manual operation
- Built-in blade immersion cooling system
- Electronic speed display
- Compact & sturdy design
- Powerful 942W (1.2 hp) motor
- Vises, backstops, and cutting guide are available



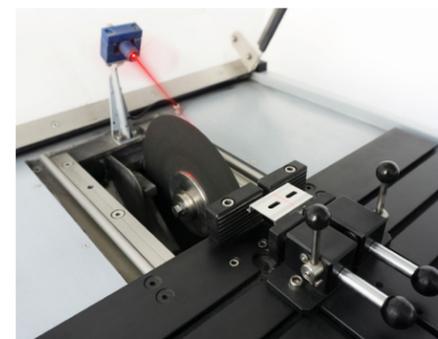
PICO-200S Control Panel



PICO-200S

Precision Table Feed Metallographic Wafering Saws

Model Name	PICO-200A	PICO-200S
Control	5-inch touchscreen	Analog control with LED display
Cutting Force	25 N (2500 grams)	N/A
Cutting Capacity	Max. diameter 2-inch (50 mm)	Max. diameter 1-inch (30 mm)
Blades	6-inch (152 mm) - 8-inch (203 mm)	6-inch (152 mm) - 8-inch (203 mm)
Arbor Size	0.5-inch (12.7 mm)	0.5-inch (12.7 mm)
Max Square Cutting	2 x 5-inch (50 x 126 mm)	1 x 4-inch (30 x 100 mm)
Variable Speed (rpm)	500-3000 rpm	500-3000 rpm
Coolant Tank	5 liters	2.5 liters
Motor Power	1200W (1.6 hp)	942W (1.2 hp)
Cutting Force (maximum)	2500 grams	2500 grams
Table Feed	Auto / Manual with joystick	Manual wheel feed
Electrical Specification	110V/220V (50/60 Hz)	110V/220V (50/60 Hz)
Y-axis	Manual or Automatic	Manual
Working Table (W x D)	18.3 x 10.6-inch (465 x 270 mm)	13.8 x 14.6-inch (350 x 370 mm)
Travel Range	9.45-inch (240 mm)	3.94-inch (100 mm)
Dimensions (W x D x H)	Hood closed: 22 x 28 x 16-inch (57 x 72 x 41 cm) Hood open: 22 x 28 x 35-inch (57 x 72 x 90 cm)	Hood closed: 18.5 x 20 x 14-inch (47 x 50.5 x 36 cm) Hood open: 18.5 x 22 x 25-inch (47 x 56 x 63 cm)
Weight	139 lbs (63 kg)	100 lbs (45 kg)



PICO-200A with laser alignment for precision cutting. Horizontal quick clamping vises (left & right), and backstops are available.

TIP: When cutting hard or ductile engineered ceramics, such as silicon nitride, boron carbide, and partially stabilized zirconia, higher loads and speeds are required. This makes the PICO-200A Precision Table Saw ideal for sectioning these challenging materials.

2 year warranty Limited Warranty

Benefits:

- ◆ Secure clamping mechanism
- ◆ 500-3000 rpm speeds
- ◆ Maximum applied force 2500 grams
- ◆ Accepts 6-8 inch wafering blade sizes
- ◆ Built-in coolant system with internal pump (PICO-200A) & blade immersion cooling system (PICO-200S)
- ◆ Magnetic safety switch
- ◆ Emergency stop switch
- ◆ User-friendly controls
- ◆ Versatile cutting capabilities

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Machinery Directive 2006/42/EC
2014/35/ EU Low Voltage Directive
2014/30/EU Electromagnetic Compatibility Directive

PICO-155P/155S Accessories

1.25-inch Circular Vise



Sample holder for small round and mounted specimens (1.25-inch / 32 mm)
Catalog no. P150-707

1.5-inch Circular Vise



Sample holder for large round and mounted specimens (1.5-inch / 40 mm)
Catalog no. P150-708

Teardrop Vise



Specimen teardrop holder for 0.6-1.6-inch (18-40 mm)
Catalog no. P150-710

Irregular Sample Vise



Sample vise for irregular shaped samples
Catalog no. P150-706

Single Saddle Vise



Universal specimen vise (single saddle)
Catalog no. P150-702

Double Saddle Vise



Sample holder with double parallel vise for long specimens (double saddle)
Catalog no. P150-703

Large Universal Vise



Large single saddle vise with support lip
Catalog no. P150-702b

Adhering Vise



Specimen vise for adhering or gluing samples
Catalog no. P150-709

Fastener Vise



Fastener vise for longitudinal sectioning of fasteners, tubes, etc.
Catalog no. P150-711

Dressing Fixture



Dressing stone attachment
Catalog no. P150-701

Cutting Table



Cutting table attachment for manual cutting of flat specimens and PCB's
Catalog no. P150-601

Weight Stack



Stainless steel weight stack
Counter Balance weight:
Catalog no. P150-410
250 g. weight: **Catalog no. P155-M-012**
300 g. weight: **Catalog no. P155-M-013**
Rod: **Catalog no. P150-411**

50 mm Flanges



50 mm diameter arbor flanges
Catalog no. P155-M-002

75 mm Flanges



75 mm diameter arbor flanges
Catalog no. P155-M-003

100 mm Flanges



100 mm diameter arbor flanges
Catalog no. P155-M-100

1x3-inch Glass Slide



Vacuum glass slide holder for 1x3-inch petrographic slides
Catalog no. P155-GHL

27x46 mm Glass Slide



Vacuum glass slide holder for 27x46 mm petrographic slides
Catalog no. P155-GHS

Sample Support Arm



Sample support arm with multiple specimen vise positioning locations
Catalog no. P150-407

Swivel Support Arm



Sample support arm with swivel for angular cutting
Catalog no. P150-713

PICO-200A/200S Accessories

Horizontal Clamping Vises



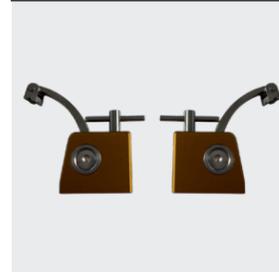
Horizontal quick clamping vises
Left: **Catalog no. P200-QCL**
Right: **Catalog no. P200-QCR**

Backstops



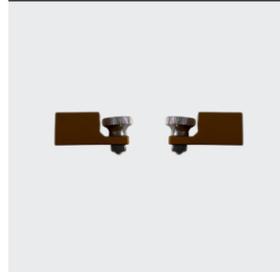
Backstops for horizontal quick clamping vises
Catalog no. P200B

Vertical Clamping Vises



Vertical clamping vises with shoes
Catalog no. P200V

Height Adapters



Height adapters for vertical clamping vises
Catalog no. P200H

Cutting Guide



Cutting guide
Catalog no. P200G



Metallographic Copper Plated Diamond Blades



Metallographic Stainless Steel Diamond Blades



Electroplated Diamond Blades

3-inch (75 mm) Diamond Blades (1/2-inch arbor, 0.006-inch thick)



PACE Product Name	Catalog Number	Qty
3-inch Diamond Wafering Blade (fine-grit, low conc.)	WB-0030LC	each
3-inch Diamond Wafering Blade (medium-grit, low conc.)	WB-0035LC	each
3-inch Diamond Wafering Blade (medium-grit, high conc.)	WB-0035HC	each
3-inch CBN Wafering Blade (medium-grit, high conc.)	WCBN-0035	each

4-inch (102 mm) Diamond Blades (1/2-inch arbor, 0.012-inch thick)



PACE Product Name	Catalog Number	Qty
4-inch Diamond Wafering Blade (fine-grit, low conc.)	WB-0040LC	each
4-inch Diamond Wafering Blade (medium-grit, low conc.)	WB-0045LC	each
4-inch Diamond Wafering Blade (medium-grit, high conc.)	WB-0045HC	each
4-inch CBN Wafering Blade (medium-grit, high conc.)	WCBN-0045	each
4 x 0.024 x 0.5-inch Electroplated 120-grit Diamond Blade	WB-040EPD	each
4-inch Diamond Wafering Blade (coarse grit, high conc.)	WB-0045CHC	each

5-inch (127 mm) Diamond Blades (1/2-inch arbor, 0.015-inch thick)



PACE Product Name	Catalog Number	Qty
5-inch Diamond Wafering Blade (fine-grit, low conc.)	WB-0050LC	each
5-inch Diamond Wafering Blade (medium-grit, low conc.)	WB-0055LC	each
5-inch Diamond Wafering Blade (medium-grit, high conc.)	WB-0055HC	each
5-inch CBN Wafering Blade (medium-grit, high conc.)	WCBN-0055	each
5 x 0.024 x 0.5-inch Electroplated 120-grit Diamond Blade	WB-050EPD	each
5-inch Diamond Wafering Blade (coarse grit, high conc.)	WB-0055CHC	each

6-inch (153 mm) Diamond Blades (1/2-inch arbor, 0.020-inch thick)



PACE Product Name	Catalog Number	Qty
6-inch Diamond Wafering Blade (fine-grit, low conc.)	WB-0060LC	each
6-inch Diamond Wafering Blade (medium-grit, low conc.)	WB-0065LC	each
6-inch Diamond Wafering Blade (medium-grit, high conc.)	WB-0065HC	each
6-inch CBN Wafering Blade (medium-grit, high conc.)	WCBN-0065	each
6 x 0.032 x 0.5-inch Electroplated 120-grit Diamond Blade	WB-060EPD	each
6-inch Diamond Wafering Blade (coarse grit, high conc.)	WB-0065CHC	each

7-inch (175 mm) Diamond Blades (1/2-inch arbor, 0.020-inch thick)



PACE Product Name	Catalog Number	Qty
7-inch Diamond Wafering Blade (fine-grit, low conc.)	WB-0070LC	each
7-inch Diamond Wafering Blade (medium-grit, low conc.)	WB-0075LC	each
7-inch Diamond Wafering Blade (medium-grit, high conc.)	WB-0075HC	each
7-inch CBN Wafering Blade (medium-grit, high conc.)	WCBN-0075	each
7 x 0.039 x 0.5-inch Electroplated 120-grit Diamond Blade	WB-070EPD	each
7-inch Diamond Wafering Blade (coarse grit, high conc.)	WB-0075CHC	each

8-inch (204 mm) Diamond Blades (1/2-inch arbor, 0.024-inch thick)



PACE Product Name	Catalog Number	Qty
8-inch Diamond Wafering Blade (fine-grit, low conc.)	WB-0080LC	each
8-inch Diamond Wafering Blade (medium-grit, low conc.)	WB-0085LC	each
8-inch Diamond Wafering Blade (medium-grit, high conc.)	WB-0085HC	each
8-inch CBN Wafering Blade (medium-grit, high conc.)	WCBN-0085	each
8 x 0.039 x 0.5-inch Electroplated 120-grit Diamond Blade	WB-080EPD	each
8-inch Diamond Wafering Blade (coarse grit, high conc.)	WB-0085CHC	each

Precision Abrasive Blades (1/2-inch arbor)



PACE Product Name	Catalog Number	Qty
5 x 0.040-inch SiC Abrasive Blade (non-ferrous metals)	MAX-C125	10
6 x 0.038-inch SiC Abrasive Blade (non-ferrous metals)	MAX-C150	10
6 x 0.062-inch Alumina Abrasive Blade (ferrous metals)	MAX-D150	10
7 x 0.028-inch Abrasive Blade (general purpose)	MAX-7000S	10

Wafer Cutting Accessories



PACE Product Name	Catalog Number	Qty
DIACUT™ Dressing Stick (1/2 x 1/2 x 4-1/2-inch)	DRES-0010	each
DIACUT™ Oil-based Cutting Fluid (16 oz)	OL-3000-16	16 oz
DIACUT™ Oil-based Cutting Fluid (32 oz)	OL-3000-32	32 oz
DIACUT™ Water-based Cutting Fluid (16 oz)	WL-3000-16	16 oz
DIACUT™ Water-based Cutting Fluid (32 oz)	WL-3000-32	32 oz
DIACUT™ 2 Water-based Anti-corrosion Cutting Fluid (16 oz)	WL2-3000-16	16 oz
DIACUT™ 2 Water-based Anti-corrosion Cutting Fluid (32 oz)	WL2-3000-32	32 oz
Propylene Glycol-based Anti-Corrosion Additive (32 oz)	PCC-5000-32	32 oz

Economical Stainless Steel Diamond Wafering Blades (Best Value)

Diamond / CBN Wafering Blades with Corrosion Resistant Stainless Steel Core (1/2-inch arbor) - General Purpose Blade

PACE Product Name	Catalog Number	Qty
4-inch stainless steel general purpose diamond/CBN Wafering Blade	WB-004GP	each
5-inch stainless steel general purpose diamond/CBN Wafering Blade	WB-005GP	each
6-inch stainless steel general purpose diamond/CBN Wafering Blade	WB-006GP	each
7-inch stainless steel general purpose diamond/CBN Wafering Blade	WB-007GP	each
8-inch stainless steel general purpose diamond/CBN Wafering Blade	WB-008GP	each

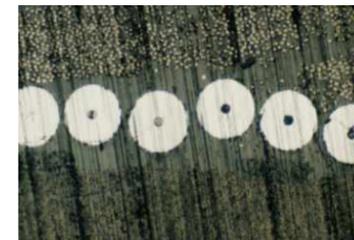
Diamond Wafering Blades (low concentration) with Corrosion Resistant Stainless Steel Core (1/2-inch arbor)

PACE Product Name	Catalog Number	Qty
4-inch stainless steel low concentration diamond Wafering Blade	WB-004LCS	each
5-inch stainless steel low concentration diamond Wafering Blade	WB-005LCS	each
6-inch stainless steel low concentration diamond Wafering Blade	WB-006LCS	each
7-inch stainless steel low concentration diamond Wafering Blade	WB-007LCS	each
8-inch stainless steel low concentration diamond Wafering Blade	WB-008LCS	each

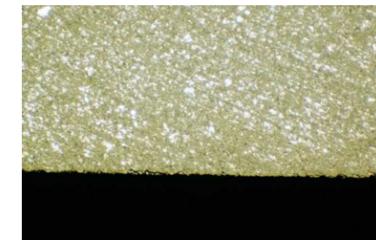
Diamond Wafering Blades (high concentration) with Corrosion Resistant Stainless Steel Core (1/2-inch arbor)

PACE Product Name	Catalog Number	Qty
4-inch stainless steel high concentration diamond Wafering Blade	WB-004HCS	each
5-inch stainless steel high concentration diamond Wafering Blade	WB-005HCS	each
6-inch stainless steel high concentration diamond Wafering Blade	WB-006HCS	each
7-inch stainless steel high concentration diamond Wafering Blade	WB-007HCS	each
8-inch stainless steel high concentration diamond Wafering Blade	WB-008HCS	each

MATERIAL	CHARACTERISTIC	SPEED (RPM)	LOAD	BLADE (grit/conc)
Silicon substrates	Soft/Brittle	<300	Low	Fine/Low
Gallium arsenide	Soft/Brittle	<200	Low	Fine/Low
Boron composites	Hard/Brittle	500	Medium	Fine/Low
Ceramic fiber composites	Hard/Brittle	1000	Medium	Fine/Low
Glass	Brittle	1000	Medium	Fine/Low
Minerals	Friable/Brittle	2500	Medium	Fine/Low
Alumina ceramic	Hard/Tough	3000	High	Medium/Low
Zirconia (PSZ)	Hard/Tough	3000	High	Medium/Low
Silicon nitride	Hard/Tough	3000	High	Medium/Low
Metal matrix composites	Hard/Tough	3000	High	Medium/High
General Purpose		Variable	Variable	Medium Coarse/High



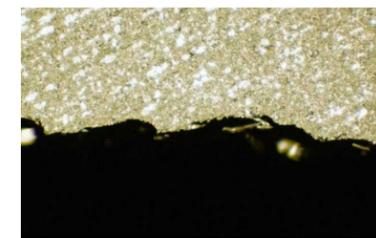
Boron-graphite composite sectioned with fine grit diamond wafering blade. Boron fibers damage minimal



Silicon edge intact after sectioning with fine grit diamond wafering blade



Boron-graphite composite sectioned with medium grit diamond wafering blade. Boron fibers damaged



Silicon edge damaged after sectioning with medium grit diamond wafering blade

TIP: Precision Wafering

1. Properly fixture or clamp the sample/specimen
2. Fixture with largest arbor flanges for better blade support
3. Set the blade speed and load
4. For samples with coatings orient the sample so the coating is cut in compression
5. Dress or condition the blade periodically when the cutting rate diminishes

Improved Precision Wafering Blades:

- ◆ Stainless steel core for improved corrosion resistance
- ◆ Economical Option
- ◆ High Quality Blade
- ◆ Available with a general purpose diamond / CBN hybrid abrasive and with the traditional low and high medium grit diamond concentration



TERAPRESS TP-7100S

TERAPRESS TP-7100S

Pneumatic Compression Mounting Press

- Pneumatic (air pressure) press
- Automatic
- Programmable
- 1200 Watt heater
- Water cooling (temperature, time and manual)
- Interchangeable and fixed sized molds available
- Mold sizes (1, 1.25, 1.5 & 2-inch / 30, 40, & 50 mm)
- High resolution display
- Highly reproducible mounts
- Robust and durable design
- Economical



TERAPRESS TP-7500S

TERAPRESS TP-7500S

Hydraulic Compression Mounting Press

- Hydraulic force
- Automatic
- Programmable
- 1200 Watt heater
- Water cooling (temperature, time and manual)
- Interchangeable and fixed sized molds available
- Mold sizes (1, 1.25, 1.5 & 2-inch / 30, 40, & 50 mm)
- High resolution display
- Highly reproducible mounts
- Robust and durable design
- Economical

TERAPRESS TP-TANK

Recirculating Cooling System

- Eco-friendly recirculating and cooling system
- 24V pump (connected to 110V or 220V power supply)
- 1.3 GPM maximum flow
- Easy to operate
- Economical



TP-TANK

CE Machinery Directive 2006/42/EC
2014/35/ EU Low Voltage Directive
2014/30/EU Electromagnetic Compatibility Directive

Pneumatic Mounting Press

Model Name	TERAPRESS TP-7100S
Force Type	Pneumatic
Control Interface	Touchscreen display
Heating Power	1200 Watts
Voltage	110V or 220V (single phase)
Max Input Pressure	95 psi
Max Temperature	392°F (200°C)
Cooling Type	Water-cooled with manual, temperature, or time control
Mold Sizes	1, 1.25, 1.5 and 2-inch (30, 40, and 50 mm)
Dimensions (W x D x H)	21 x 19 x 19 in (530 x 485 x 485 mm)
Weight	69 lbs (32 kg)
Optional Accessory	TP-TANK Recirculating / Cooling Tank (14 gal with pump)
Catalog Number	TP-7100S-110V / TP-7100S-220V

2 year warranty
Limited Warranty

Benefits:

- ◆ Lower cost
- ◆ Fast cycle times
- ◆ Interchangeable or fixed size molds
- ◆ 7-inch touchscreen
- ◆ Soft Start capabilities
- ◆ Custom procedures list
- ◆ Heating graph for monitoring temperature and cycle progress

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Hydraulic Mounting Press

Model Name	TERAPRESS TP-7500S
Force Type	Hydraulic
Max Force	32 MPa (4500 psi)
Control Interface	Touchscreen display
Heating Power	1200 Watts
Voltage	110V or 220V
Max Temperature	392°F (200°C)
Cooling Type	Water-cooled with manual, temperature, or time control
Mold Sizes	1, 1.25, 1.5 and 2-inch (30, 40, and 50 mm)
Dimensions (W x D x H)	21 x 19 x 19-inches (530 x 480 x 480 mm)
Weight	108 lbs (50 kg)
Optional Accessory	TP-TANK Recirculating / Cooling Tank (14 gal with pump)
Catalog Number	TP-7500S-110V / TP-7500S-220V

Benefits:

- ◆ Higher hydraulic mounting force
- ◆ Fast cycle times
- ◆ Interchangeable or fixed size molds
- ◆ Soft start capabilities
- ◆ Quiet operation
- ◆ 7-inch touchscreen
- ◆ Custom procedures list
- ◆ Heating graph for monitoring temperature and cycle progress

Recirculating / Coolant System

Model Name	TP-TANK
Cooling Type	Water-cooled with manual, temperature, or timer control
Power	75 watts
Pump	Diaphragm pump 0.86 GPM (3.25L/ min)
Voltage	110-220V (single phase)
Tank Volume	14 gal (53 L)
Weight	28 lbs (13 kg)
Dimensions (W x D x H)	16 x 28 x 26-inch (410 x 710 x 660 mm)
Catalog Number	TP-TANK

Benefits:

- ◆ Environmentally smart
- ◆ Allows for TP-7100S & TP-7500S to be mobile
- ◆ More controlled cooling temperature

TERAPRESS Mold Assemblies

1-inch Mold Assembly



1.0-inch interchangeable mold assembly contains mold sleeve, lower/upper ram (spacer optional)
Catalog no. TP75-0100

1.25-inch Mold Assembly



1.25-inch interchangeable mold assembly contains mold sleeve, lower/upper ram (spacer optional)
Catalog no. TP75-0125

1.5-inch Mold Assembly



1.5-inch interchangeable mold assembly contains mold sleeve, lower/upper ram (spacer optional)
Catalog no. TP75-0150

30 mm Mold Assembly



30 mm interchangeable mold assembly contains sleeve, lower/upper ram (spacer optional)
Catalog no. TP75-30

40 mm Mold Assembly



40 mm interchangeable mold assembly contains sleeve, lower/upper ram (spacer optional)
Catalog no. TP75-40

Interchangeable Molds:

- ◆ Allows for easy changing of mold size. Simply replace mold, sleeve and rams
- ◆ Available in 1, 1.25 and 1.5-inch as well as 30 and 40 mm molds

Fixed Block Molds:

- ◆ The heater/cooler is manufactured to match the size of the mold (does not require a mold sleeve)
- ◆ Reduces cooling times for producing faster mounts
- ◆ Available in 1, 1.25, 1.5 and 2-inch as well as 30, 40 and 50 mm sizes

TERAPRESS Heating/Cooling Blocks

1.0-inch Fixed Sized Heater / Mold Assembly



1.0-inch Heating / Cooling block with lower & upper rams (spacer optional)
Catalog no. TP75-0100H

1.25-inch Fixed Sized Heater / Mold Assembly



1.25-inch Heating / Cooling block with lower & upper rams (spacer optional)
Catalog no. TP75-0125H

1.5-inch Fixed Sized Heater / Mold Assembly



1.5-inch Heating / Cooling block with lower & upper rams (spacer optional)
Catalog no. TP75-0150H

2.0-inch Fixed Sized Heater / Mold Assembly



2.0-inch Heating / Cooling block with lower & upper rams (spacer optional)
Catalog no. TP75-0200H

30 mm Fixed Sized Heater / Mold Assembly



30 mm Heating / Cooling block with lower & upper rams (spacer optional)
Catalog no. TP75-30H

40 mm Fixed Sized Heater / Mold Assembly



40 mm Heating / Cooling block with lower & upper rams (spacer optional)
Catalog no. TP75-40H

50 mm Fixed Sized Heater / Mold Assembly



50 mm Heating / Cooling block with lower & upper rams (spacer optional)
Catalog no. TP75-50H

Mold Assemblies for Interchangeable Mold Heater

TERAPRESS Molds	Mold Spacers		TERAPRESS Spacers	Flat Ram Catalog no.	Chamfered Ram Catalog no.
	Flat Ram Catalog no.	Chamfered Ram Catalog no.			
1-inch diameter mold assembly	TP75-0100	TP75-0100C	1-inch diameter spacer	TPS-0100	TPS-0100C
1.25-inch diameter mold assembly	TP75-0125	TP75-0125C	1.25-inch diameter spacer	TPS-0125	TPS-0125C
1.5-inch diameter mold assembly	TP75-0150	TP75-0150C	1.5-inch diameter spacer	TPS-0150	TPS-0150C
			2-inch diameter spacer	TPS-0200	TPS-0200C
30 mm diameter mold assembly	TP75-30	TP75-30C			
40 mm diameter mold assembly	TP75-40	TP75-40C	30 mm diameter spacer	TPS-30	TPS-30C
			40 mm diameter spacer	TPS-40	TPS-40C

Mold Assemblies for Fixed Mold Heater

TERAPRESS Fixed sized Heater / Molds	Flat Ram Catalog no.	Chamfered Ram Catalog no.
1-inch diameter fixed heater / cooler assembly	TP75-0100H	TP75-0100HC
1.25-inch diameter fixed heater / cooler assembly	TP75-0125H	TP75-0125HC
1.5-inch diameter fixed heater / cooler assembly	TP75-0150H	TP75-0150HC
2-inch diameter fixed heater / cooler assembly	TP75-0200H	TP75-0200HC
30 mm diameter fixed heater / cooler assembly	TP75-30H	TP75-30HC
40 mm diameter fixed heater / cooler assembly	TP75-40H	TP75-40HC
50 mm diameter fixed heater / cooler assembly	TP75-50H	TP75-50HC



	PHENOLICS	ACRYLIC	EPOXY (glass-filled)	DIALLYL PHTHALATE
Type	Thermoset	Thermoplastic	Thermoset	Thermoset
Cost	Low	Moderate	Moderate	Moderate
Ease of Use	Excellent	Moderate	Good	Good
Color	Black, red, green	Clear	Gray	Blue
Cycle Time (1.25-inch mount) TERAPRESS TP-7500S (minimum)	4-5 minutes	8-10 minutes	5-7 minutes	5-7 minutes
Edge Retention	Fair	Good	Excellent	Excellent
Clarity	None	Excellent	None	None
Hardness	Low	Medium	High	High

	PHENOLICS	ACRYLIC	EPOXY (glass-filled)	DIALLYL PHTHALATE
Shore-D hardness	82	80	88	88
Shrinkage (in/in)	0.006	0.001-0.003	0.001-0.003	0.001-0.003
Chemical resistance	Glycol, petrochemicals, solvents, acids	Alcohol, dilute acids, solvents	Solvents, acids, alkalies & oxidizers	Solvents, acid and alkalies

Phenolic Compression Mounting



PACE Product Name	Catalog Number	Qty
Black Phenolic powder (5 lbs)	CM-2001B-5	5 lbs
Black Phenolic powder (25 lbs)	CM-2001B-25	25 lbs
Red Phenolic powder (5 lbs)	CM-2001R-5	5 lbs
Red Phenolic powder (25 lbs)	CM-2001R-25	25 lbs
Green Phenolic powder (5 lbs)	CM-2001G-5	5 lbs
Green Phenolic powder (25 lbs)	CM-2001G-25	25 lbs

TIP: Phenolic Colors

Use different phenolic colors to code jobs, specimen types or for different test dates. For example, changing the phenolic color each month will show which samples or jobs are getting old.

If the color dye in the mount bleeds out when rinsing with alcohol, this is an indication that the mount was not fully cured either at a high enough temperature or for the proper length of time.

Phenolic PREMIUM Compression Mounting with Mold Release Agent



PREMIUM Phenolic Powders

PACE Product Name	Catalog Number	Qty
Black PREMIUM Phenolic powder (2.5 kg)	CM-2500B-2	2.5 kg
Black PREMIUM Phenolic powder (7.5 kg)	CM-2500B-8	7.5 kg
Red PREMIUM Phenolic powder (2.5 kg)	CM-2500R-2	2.5 kg
Red PREMIUM Phenolic powder (7.5 kg)	CM-2500R-8	7.5 kg
Green PREMIUM Phenolic powder (2.5 kg)	CM-2500G-2	2.5 kg
Green PREMIUM Phenolic powder (7.5 kg)	CM-2500G-8	7.5 kg

Acrylic Clear Compression Mounting

PACE Product Name	Catalog Number	Qty
TRANSACRYLIC clear compression mounting powder (5 lbs)	CM-2101A-5	5 lbs
TRANSACRYLIC clear compression mounting powder (25 lbs)	CM-2101A-25	25 lbs



TIP: Acrylic Mounts

A common issue with acrylic mounts, known as the "cotton ball" effect, can occur when using thermoplastic acrylic resins. This is typically caused by heating the compression mounting resin too quickly or to a temperature that causes a liquid layer to form around unmelted powder particles, trapping air that cannot escape.

Due to the high heating efficiency of PACE Technologies mounting presses, it is recommended to use a maximum curing temperature not exceeding 130 °C. Additionally, preheating to 120 °C and allowing the press to reach thermal equilibrium is advised.

Note: Heating rates vary among manufacturers, so results may differ depending on the mounting press used.

Glass Filled Epoxy Compression Mounting

PACE Product Name	Catalog Number	Qty
EPOCOMP Epoxy Resin powder (5 lbs)	EP-2201A-5	5 lbs
EPOCOMP Epoxy Resin powder (25 lbs)	EP-2201A-25	25 lbs
EPOCOMP Fine Epoxy Resin powder (5 lbs)	EPF-2201-5	5 lbs
EPOCOMP Fine Epoxy Resin powder (25 lbs)	EPF-2201-25	25 lbs



TIP: Glass Filled Mounts

- ◆ Glass filled epoxies and diallyl phthalates are excellent mounting compounds for protecting the specimen edges during grinding and polishing.
- ◆ Glass filled resins can be expensive, so to reduce the cost per mount, it is recommended that the epoxy or diallyl phthalate be used at the specimen interface and then layered with a lower cost mounting compound such as a phenolic. A common combination is red phenolic / glass filled epoxy.

Acrylic PREMIUM Clear Compression Mounting

PACE Product Name	Catalog Number	Qty
TRANSACRYLIC clear compression mounting powder (1 kg)	CM-2501A-1	1 kg
TRANSACRYLIC clear compression mounting powder (2.5 kg)	CM-2501A-2	2.5 kg
TRANSACRYLIC clear compression mounting powder (7.5 kg)	CM-2501A-8	7.5 kg



PREMIUM Glass Filled Epoxy-Phenolic Compression Mounting

PACE Product Name	Catalog Number	Qty
PREMIUM Glass Filled Epoxy-Phenolic edge retention compression mounting resin (2.5 kg)	EPF-2500-2	2.5 kg
PREMIUM Glass Filled Epoxy-Phenolic edge retention compression mounting resin (8 kg)	EPF-2500-8	7.5 kg



Diallyl Phthalate Compression Mounting

PACE Product Name	Catalog Number	Qty
Diallyl Phthalate blue compression mounting powder (5 lbs)	DY-2301A-5	5 lbs
Diallyl Phthalate blue compression mounting powder (25 lbs)	DY-2301B-25	25 lbs



Conductive Compression Mounting



PACE Product Name	Catalog Number	Qty
Conductive (graphite) powder (1 lb)	CONDUCTO-1P	1 lb
Conductive (graphite) powder (5 lbs)	CONDUCTO-5P	5 lbs
Conductive (graphite) powder (25 lbs)	CONDUCTO-25P	25 lbs
<hr/>		
Conductive (copper) powder (1 lb)	CONDUCTO-CU-1	1 lb
Conductive (copper) powder (5 lbs)	CONDUCTO-CU-5	5 lbs
Conductive (copper) powder (25 lbs)	CONDUCTO-CU-25	25 lbs

TIP: Conductive Mounts

- ◆ Conductive mounts are used to provide conductivity to the mount for use with electron microscopy
- ◆ Conductive mounts use either graphite powder or copper as the conductive filler

Conductive Premium Compression Mounting



PACE Product Name	Catalog Number	Qty
Conductive Premium (graphite) powder (1 kg)	CONDUCTO-G1000	1 kg
Conductive Premium (graphite) powder (2.5 kg)	CONDUCTO-G2500	2.5 kg
Conductive Premium (graphite) powder (7.5 kg)	CONDUCTO-G7500	7.5 kg
<hr/>		
Conductive Premium (copper) powder (1 kg)	CONDUCTO-CU1000	1 kg
Conductive Premium (copper) powder (2.5 kg)	CONDUCTO-CU2500	2.5 kg
Conductive Premium (copper) powder (7.5 kg)	CONDUCTO-CU7500	7.5 kg

Miscellaneous Compression Mounting Accessories



MOLD RELEASE



HEAT PROTECTIVE GLOVES



DISPOSABLE GLOVES



MKLIP



SKLIP



KLIP



MULTIKLIP



UNIKLIP



MEASURING CUP



SCRIBE

PACE Product Name	Catalog Number	Qty
Mold release (8 oz)	MR-1000-08	8 oz
Mold release (16 oz)	MR-1000-16	16 oz
Mold release (1 gallon)	MR-1000-128	1 gallon
<hr/>		
Utility heat protective gloves (pair)	GLOVES	pair
Small disposable protective gloves (100/box)	GLOVES-S100	100/box
Medium disposable protective gloves (100/box)	GLOVES-M100	100/box
Large disposable protective gloves (100/box)	GLOVES-L100	100/box
Metal MKLIP specimen clips (100/pkg)	MKLIP-0100	100/pkg
Plastic SKLIP spring specimen clips (100/pkg)	SKLIP-0100	100/pkg
Plastic SKLIP spring specimen clips (1000/pkg)	SKLIP-1000	1000/pkg
Plastic KLIP specimen clips (100/pkg)	KLIP-0100	100/pkg
Plastic MULTIKLIP specimen clips (100/pkg)	MULTIKLIP-0100	100/pkg
Plastic UNIKLIP specimen clips (100/pkg)	UNIKLIP-0100	100/pkg
30 ml measuring scoop	MS-1000-30	each
Scribing tool	SCRIBE	each

Compression Mounting Recommended Procedures:

- ◆ Clean specimens to remove cutting and handling residue
- ◆ Remove debris from mold assembly
- ◆ Apply thin coat of mold release compound to mold assembly
- ◆ Raise mold ram to up position
- ◆ Center specimen on ram
- ◆ Lower ram assembly
- ◆ Pour predetermined amount of resin into mold
- ◆ Lock mold assembly cover
- ◆ Slowly raise ram into up position
- ◆ Apply recommended heat and maintain force for specified period of time
- ◆ Cool to near room temperature
- ◆ Remove mounted specimen
- ◆ Clean mold and ram assembly



TeraVAC

TeraVAC

Castable Vacuum Impregnation Chamber

- Pour under vacuum and cure at room pressure to better fill voids and porosity
- Tilting, retractable pouring arm
- Cure at room pressure
- Easy to Use
- Robust and durable design
- Economical



TeraVAC Pro

TeraVAC Pro

Programmable Castable Vacuum Impregnation Chamber

- Pour under vacuum and cure at room pressure to better fill voids and porosity
- Program-controlled operation (vacuum level, cycle count, and timing parameters)
- Large vacuum chamber capacity - up to 12 samples - 1.5-inch (40 mm) diameter
- Built-in electric rotating table for efficient mold location
- User-friendly interface
- Low noise operation for a quieter lab environment
- Compact footprint and manageable weight

	ACRYLICS	EPOXY	POLYESTER
Type	Acrylic resin and hardener	Epoxy resin and hardener	Polyester resin and hardener
Peak Temperature	150°F (65°C)	100°F-375°F (38-190°C)	100°F (38°C)
Shore-D Hardness	80 (90+ for SUPERMOUNT)	82	76
Cure Time	8-15 minutes	30 minutes for 8 hours	6-8 hours
Comments	Some shrinkage	Moderate hardness, low shrinkage, transparent	Transparent and clear

Metallographic Castable Vacuum Impregnation Chamber

Model Name	TeraVAC
Bell jar	Tilting, retractable pouring arm
Mount sizes	1, 1.25, 1.5 and 2-inch - 25, 30, 40 and 50 mm
Dimensions (WxDxH)	12 x 12 x 12-inch (300 x 300 x 300 mm)
Weight	2.2 lbs (1 kg)
Catalog Number	TeraVAC

Model Name	Vacuum Pump (Sold Separately)
Flow Rate	2 CFM (48 L/min)
Ultimate Vacuum Pressure	50 micron
Power	110V or 220V, 0.35 hp
Inlet Ports	1/4" SAE and 1/2" ACME ports
Dimensions (WxDxH)	5 x 12 x 9.6-inch (130 x 310 x 240 mm)
Weight	13.7 lbs (6.2 kg)
Catalog Number	110V: VAC-110 220V: VAC-220

Model Name	TeraVAC Pro
Power	100-240V, 50/60 Hz, 35W (excluding pump)
Control Interface	5-inch touch screen
Vacuum Range	0-90 kPa
Vacuum Flow Rate	75 L/min
Cycle Range	0-10 min, up to 100 cycles
Programs	20 programmable sets
Noise Level	55-60 dB
Chamber Capacity	Up to 12 samples - 1.5-inch (40 mm) diameter
Max Mold Height	3.1-4-inch (80-100 mm) (depending on mold diameter)
Dimensions (WxDxH)	Open: 20 x 18 x 25-inch (507 x 464 x 644 mm) Closed: 20 x 18 x 10.5-inch (507 x 464 x 267 mm)
Weight	40 lbs (18 kg)
Catalog Number	TeraVAC Pro

CASTABLE RESINS	RESIN MIXTURE	PROPERTIES
CASTAMOUNT Acrylic	3-parts powder and 2-parts liquid	Translucent, fast cure
PREMIUM Acrylic	3-parts powder and 2-parts liquid	Translucent, fast cure
ACRYLIC PLUS Acrylic	2-parts powder and 1-part liquid	Semi-clear, fast cure, lower cost
SUPERMOUNT Acrylic	3-parts powder and 2-parts liquid	Grayish/black, hard, low shrinkage, fast cure
Epoxy Standard	5:1 resin:hardener (wt.)	Clear to translucent, low shrinkage, 4-8 hour cure
Epoxy PLUS	11:2 resin:hardener (wt.)	Clear to translucent, low shrinkage, 4-8 hour cure
Epoxy ELITE-2	10:1 resin:hardener (wt.)	Clear, good viscosity, environmentally friendly, 4-6 hour cure
Quick Mount Epoxy	10:1 resin:hardener (wt.)	Translucent, slightly yellow, 30 minute - 2 hour cure
ULTRATHIN Epoxy	10:1 resin:hardener (wt.)	Clear, low viscosity for porous specimens, 2-6 hour cure
ULTRATHIN Epoxy PLUS	18:5 resin:hardener (wt.)	Clear, low viscosity for porous specimen, 2-6 hour cure
POLYCAST Polyester	Polyester (2-liquids)	Clear and relatively inexpensive

2 year warranty
Limited Warranty

Benefits:

- ◆ Ideal for diverse materials (metals, ceramics, composites)
- ◆ Connects to air or vacuum pump for flexibility
- ◆ Large batch processing
- ◆ Suitable for porous, cracked, or fragile samples
- ◆ Versatile mold options
- ◆ User-friendly controls

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Benefits:

- ◆ Able to pull vacuum and pour under vacuum
- ◆ Pour multiple samples
- ◆ High visibility chamber
- ◆ Easy to Use
- ◆ Robust and Durable

CASTABLE MOUNTING CHAMBERS

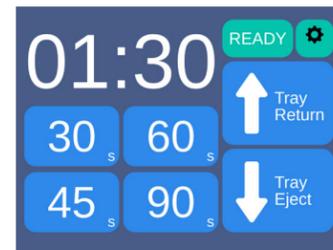
TeraUV ULTRAVIOLET MOUNTING



TeraUV

UV Mounting Curing Chamber

- Rapid & efficient - cures in 60 seconds
- Efficient UV light sources for uniform curing
- Automated operation
- User-friendly interface
- Low heat generation and efficient cooling
- Versatile mounting options
- Compact & lightweight design



TeraUV Control Screen

Castable Metallographic UV Mounting

Model Name	TeraUV
Sample Tray Total Dimension	11.5 x 9.1-inch (291 x 230 mm)
Curing Area	9.1 x 7.1-inch (230 x 180 mm)
Sample Tray Max. Height	2-inch (50 mm)
UV Curing Time	0-999 secs
UV Light Wavelength	365 nm
Power Supply	110/220V (50/60Hz)
Dimensions (W x D x H)	Closed: 15.7 x 15.9 x 7.6-inch (400 x 405 x 195 mm) Open: 15.7 x 25.1 x 7.6-inch (400 x 639 x 195 mm)
Weight	46 lbs (21 kg)
Catalog Number	TeraUV

2 year warranty
Limited Warranty

Benefits:

- ◆ 60 seconds curing
- ◆ Fully automated operation
- ◆ Mounting trays accepts multiple molds
- ◆ Even and consistent curing
- ◆ Lab time-saving
- ◆ Versatile mold options
- ◆ User-friendly controls
- ◆ Compact design

Castable Metallographic Pressure Mounting

Model Name	TeraCOMP
Operating Pressure	2.0 bar (29 psi)
Mount Sizes	1, 1.25, 1.5 and 2-inch 25, 30, 40 and 50 mm
Safety Valve Overflow Pressure	2.8 ~ 3.3 bar (40.6 ~ 48 psi)
Chamber Diameter	9.3 x 6.7-inch (235 x 170 mm)
Dimensions (W x D x H)	Closed: 12.1 x 16.3 x 11.4-inch (308 x 415 x 289 mm) Open: 12.1 x 16.3 x 13.5-inch (308 x 415 x 342 mm)
Weight	18.8 lbs (8.5 kg)
Catalog Number	TeraCOMP

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Benefits:

- ◆ Produces clearer mounts with less entrapped gas bubbles
- ◆ Pressure mounting promotes filling voids, porosity and cracks
- ◆ High-quality results
- ◆ Odor-free operation
- ◆ Simple interface for quick specimen prep
- ◆ Small footprint

YouTube Tutorials at
[youtube.com/@pacetechnologies](https://www.youtube.com/@pacetechnologies)
or scan the QR code below



TeraCOMP PRESSURE MOUNTING



TeraCOMP

Pressure Mounting Chamber

- Void-free specimens (up to 2 bar/ 9 psi)
- Maintains the original properties of the resin and curing agents
- Odor-free curing process
- Built-in timer
- Supports 1, 1.25, 1.5, and 2-inch (25, 30, 40 and 50 mm) mounts
- User-friendly operation
- Compact & lightweight design



TeraCOMP Control Panel

CE Machinery Directive 2006/42/EC
2014/35/ EU Low Voltage Directive
2014/30/EU Electromagnetic Compatibility Directive

Acrylic Castable Mounting:

Castable acrylics are easy to use and highly durable. Their primary advantage is a fast curing time. Depending on the mixing ratio, castable acrylic mounts are typically ready for use within 8–15 minutes.

Unlike epoxy resins, the ratio between the acrylic components—powder and liquid—can be adjusted by up to 25% without negatively affecting the final properties of the mount. This flexibility is possible because both the liquid and powder are acrylic-based materials containing various additives and curing agents.

By adjusting the liquid-to-powder ratio, the curing time and viscosity of the mixture can be controlled to meet specific application requirements.

PACE Product Name	Catalog Number	Qty
CASTAMOUNT Acrylic kit (1 lb resin with 12 oz liquid hardener)	AK-5000-K1	1 lb
CASTAMOUNT Acrylic kit (5 lbs resin with 1/2 gallon liquid hardener)	AK-5000-K5	5 lbs
CASTAMOUNT Acrylic Powders		
CASTAMOUNT Acrylic powder (1 lb)	AR-5000-P1	1 lb
CASTAMOUNT Acrylic powder (5 lbs)	AR-5000-P5	5 lbs
CASTAMOUNT Acrylic powder (25 lbs)	AR-5000-P25	25 lbs
CASTAMOUNT Acrylic powder (100 lbs)	AR-5000-P100	100 lbs
CASTAMOUNT Acrylic Liquids		
CASTAMOUNT Acrylic hardener (12 oz)	AH-5000-H12	12 oz
CASTAMOUNT Acrylic hardener (32 oz)	AH-5000-H32	32 oz
CASTAMOUNT Acrylic hardener (1/2 gallon)	AH-5000-H64	1/2 gallon
CASTAMOUNT Acrylic hardener (1 gallon)	AH-5000-H128	1 gallon
CASTAMOUNT Acrylic hardener (5 gallon)	AH-5000-H640	5 gallon

TIP: Acrylics

Acrylics can be submerged into a water bath during curing. This reduces the exotherm heat and thus reduces the shrinkage of the mount at the specimen interface. A secondary advantage is that the water also absorbs the odor.

PREMIUM Acrylics (Castable Mounting)

PACE Product Name	Catalog Number	Qty
PREMIUM Acrylic kit (1 kg resin with 500 ml liquid hardener)	PAR-5000-K1	1 kg
PREMIUM Acrylic kit (2.5 kg resin with 2 liter liquid hardener)	PAR-5000-K2	2.5 kg
PREMIUM Acrylic Powders		
PREMIUM Acrylic powder (1 kg)	PAR-5000-P1000	1 kg
PREMIUM Acrylic powder (2.5 kg)	PAR-5000-P2500	2.5 kg
PREMIUM Acrylic powder (7.5 kg)	PAR-5000-P7500	7.5 kg
PREMIUM Acrylic Liquids		
PREMIUM Acrylic hardener (500 ml)	PAH-5000-H500	500 ml
PREMIUM Acrylic hardener (1 liter)	PAH-5000-H1L	1 liter
PREMIUM Acrylic hardener (5 liters)	PAH-5000-H5L	5 liter

ACRYLIC PLUS Acrylics (Castable Mounting)



PACE Product Name	Catalog Number	Qty
ACRYLIC PLUS Castable Mounting Resin Kit (1 lb resin with 12 oz liquid hardener)	ACYP-5000-K1	1 lb
ACRYLIC PLUS Castable Mounting Resin Kit (5 lbs resin with 1/2 gallon liquid hardener)	ACYP-5000-K5	5 lbs
ACRYLIC PLUS Acrylic Powders		
ACRYLIC PLUS Resin powder (1 lb)	ACYP-5000-P1	1 lb
ACRYLIC PLUS Resin powder (5 lbs)	ACYP-5000-P5	5 lbs
ACRYLIC PLUS Resin powder (25 lbs)	ACYP-5000-P25	25 lbs
ACRYLIC PLUS Resin powder (100 lbs)	ACYP-5000-P100	100 lbs
ACRYLIC PLUS Acrylic Liquids		
ACRYLIC PLUS Resin hardener (12 oz)	ACYH-5000-H12	12 oz
ACRYLIC PLUS Resin hardener (32 oz)	ACYH-5000-H32	32 oz
ACRYLIC PLUS Resin hardener (1/2 gallon)	ACYH-5000-H64	1/2 gallon
ACRYLIC PLUS Resin hardener (1 gallon)	ACYH-5000-H128	1 gallon
ACRYLIC PLUS Resin hardener (5 gallon)	ACYH-5000-H640	5 gallon

SUPERMOUNT Glass Filled Acrylics (Castable Mounting)



PACE Product Name	Catalog Number	Qty
SUPERMOUNT Glass Filled Acrylic Kit (gray) (1 lb resin with 12 oz liquid hardener)	GRAK-5000-K1	1 lb
SUPERMOUNT Glass Filled Acrylic Kit (gray) (5 lbs resin with 1/2 gallon liquid hardener)	GRAK-5000-K5	5 lbs
SUPERMOUNT PLUS Acrylic Powders		
SUPERMOUNT Resin powder (1 lb)	GRAR-5000-P1	1 lb
SUPERMOUNT Resin powder (5 lbs)	GRAR-5000-P5	5 lbs
SUPERMOUNT Resin powder (25 lbs)	GRAR-5000-P25	25 lbs
SUPERMOUNT Resin powder (100 lbs)	GRAR-5000-P100	100 lbs
SUPERMOUNT Acrylic Liquids		
SUPERMOUNT Resin hardener (12 oz)	GRAH-3000-H12	12 oz
SUPERMOUNT Resin hardener (32 oz)	GRAH-3000-H32	32 oz
SUPERMOUNT Resin hardener (1/2 gallon)	GRAH-3000-H64	1/2 gallon
SUPERMOUNT Resin hardener (1 gallon)	GRAH-3000-H128	1 gallon
SUPERMOUNT Resin hardener (5 gallon)	GRAH-3000-H640	5 gallon

ULTRAVIOLET Resin (Castable Mounting)



PACE Product Name	Catalog Number	Qty
UV Curing Liquid (1 liter)	UV-1L	1 liter

Epoxy Castable Mounting:

The most common and best-performing castable resins are epoxy-based. These are two-part liquid systems consisting of a resin and hardener. Mixing ratios vary by mount size, larger mounts require less hardener. Advantages of mounting with epoxy resins include: low shrinkage, relatively clear, relatively low exotherm, excellent adhesion, excellent chemical resistance, good hardness, relatively inexpensive.

Epoxy Curing Characteristics:

Curing times depend on several factors, including the volume of mounting resin, as larger mounts cure faster, and the specimen's thermal mass, since specimens with higher thermal mass absorb more heat and cure more slowly. Specimen material properties also influence curing behavior. Higher initial resin and ambient temperatures accelerate curing, while high humidity and moisture absorption can degrade the resin and shorten its shelf life. The type of mounting mold used also affects heat absorption, as plastic and rubber molds behave differently during curing.

Epoxy Standard Cure (5:2 Resin: Hardener) Castable Mounting



PACE Product Name	Catalog Number	Qty
Standard Epoxy Resin		
Epoxy castable resin (32 oz)	EP-3000-32	32 oz
Epoxy castable resin (1-gallon)	EP-3000-128	1 gallon
Epoxy castable resin (5-gallons)	EP-3000-5G	5 gallons
Standard Epoxy Hardeners		
Epoxy hardener (8 oz)	EH-3000-08	8 oz
Epoxy hardener (32 oz)	EH-3000-32	32 oz
Epoxy hardener (1 gallon)	EH-3000-128	1 gallon

Epoxy PLUS Standard Cure (11:2 Resin: Hardener) Castable Mounting



PACE Product Name	Catalog Number	Qty
EPOXY PLUS Resin		
Epoxy castable resin (32 oz)	EP-3000-32P	32 oz
Epoxy castable resin (1-gallon)	EP-3000-128P	1 gallon
Epoxy castable resin (5-gallons)	EP-3000-5GP	5 gallons
EPOXY PLUS Hardeners		
Epoxy hardener (8 oz)	EH-3000-08P	8 oz
Epoxy hardener (32 oz)	EH-3000-32P	32 oz
Epoxy hardener (1 gallon)	EH-3000-128P	1 gallon

Epoxy ELITE-2 Environmentally Friendly Standard Cure (10:1 Resin: Hardener) Castable Mounting



PACE Product Name	Catalog Number	Qty
EPOXY ELITE-2 Resin		
Epoxy castable resin (32 oz)	ELITE-3000-2R-32	32 oz
Epoxy castable resin (1-gallon)	ELITE-3000-2R-128	1 gallon
Epoxy castable resin (5-gallons)	ELITE-3000-2R-5G	5 gallons
EPOXY ELITE-2 Hardeners		
Epoxy hardener (8 oz)	ELITE-3000-2H-08	8 oz
Epoxy hardener (32 oz)	ELITE-3000-2H-32	32 oz
Epoxy hardener (1 gallon)	ELITE-3000-2H-128	1 gallon

Fast Curing Quick Mounting Epoxy (10:1 Resin: Hardener) Castable Mounting



PACE Product Name	Catalog Number	Qty
Quick Mounting Epoxy Resins		
Quick Mounting fast epoxy castable resin (32 oz)	ERF-3000-32	32 oz
Quick Mounting fast epoxy castable resin (1-gallon)	ERF-3000-128	1 gallon
Quick Mounting fast epoxy castable resin (5-gallons)	ERF-3000-5G	5 gallons
Quick Mounting Epoxy Hardeners		
Quick Mounting fast epoxy hardener (8 oz)	EHF-3000-08	8 oz
Quick Mounting fast epoxy hardener (32 oz)	EHF-3000-32	32 oz
Quick Mounting fast epoxy hardener (1 gallon)	EHF-3000-128	1 gallon

ULTRATHIN 2 Low Viscosity Epoxy (10:1 Resin: Hardener) Castable Mounting



PACE Product Name	Catalog Number	Qty
ULTRATHIN 2 Low Viscosity Epoxy Resins		
Low Viscosity castable epoxy resin (32 oz)	ULTRA-3000R-32	32 oz
Low Viscosity castable epoxy resin (1-gallon)	ULTRA-3000R-128	1 gallon
Low Viscosity castable epoxy resin (5-gallons)	ULTRA-3000R-5G	5 gallons
ULTRATHIN 2 Low Viscosity Epoxy Hardeners		
Low Viscosity castable epoxy hardener (8 oz)	ULTRA-3000H-08	8 oz
Low Viscosity castable epoxy hardener (32 oz)	ULTRA-3000H-32	32 oz
Low Viscosity castable epoxy hardener (1 gallon)	ULTRA-3000H-128	1 gallon

ULTRATHIN 2 PLUS Low Viscosity Epoxy (18:5 Resin: Hardener) Castable Mounting



PACE Product Name	Catalog Number	Qty
ULTRATHIN 2 PLUS Low Viscosity Epoxy Resins		
Low Viscosity castable epoxy resin (32 oz)	ULTRA-3000R-32P	32 oz
Low Viscosity castable epoxy resin (1-gallon)	ULTRA-3000R-128P	1 gallon
Low Viscosity castable epoxy resin (5-gallons)	ULTRA-3000R-5GP	5 gallons
ULTRATHIN 2 PLUS Low Viscosity Epoxy Hardeners		
Low Viscosity castable epoxy hardener (8 oz)	ULTRA-3000H-08P	8 oz
Low Viscosity castable epoxy hardener (32 oz)	ULTRA-3000H-32P	32 oz

TIP: Epoxies

Preheat resin and sample to 35°C (95°F) to expedite the initial heating process and for decreasing overall curing time (Do not preheat the hardener as this can lead to a runaway exothermic reaction).

Polyester Castable Mounting:

Polyester resins are typically used when a very clear mount is required. They are also ideal for display mounts, where the specimen appears suspended within the plastic.

To prepare a polyester mount, first determine the appropriate mixing ratio of resin to hardener (catalyst). This ratio varies depending on the mass of the casting. The table to the right, showing polyester catalyst mixing ratios, is based on an ambient and resin temperature of 70°F.

For larger volumes, the amount of hardener must be significantly reduced.

When suspending a specimen within the mount:

1. Pour an initial layer of resin and allow it to partially cure—it should reach a gel or rubbery consistency, but not harden completely.
2. Position the object or specimen on the semi-cured layer.
3. Pour another layer of liquid polyester over it.
4. Repeat the process for multiple layers, if desired.

Single Layer Casting (metallographic)		Multiple Layer Casting (display)	
Layer Thickness (inches)	Drops of catalyst per ounce of resin	Layer	Drops of catalyst per ounce of resin
1/8	15	1st layer	4-5
1/4	8	2nd layer	3-4
1/2	6	3rd layer	2-3
3/4	5	4th layer	1-2
1-1.5	4	5th layer or more	1

Polyester Characteristics:

- ◆ Very clear (water clear)
- ◆ High odor
- ◆ Best resin system for making large casting

Polyester Resin (Clear Castable Mounting)

PACE Product Name	Catalog Number	Qty
Clear Polyester castable resin (1 gallon)	POLYCAST-128	1 gallon
Polyester Hardener (2 oz)	POLYHARD-02	2 oz
Polyester Color Dye Set (3 colors)	DYE-1000	3 colors

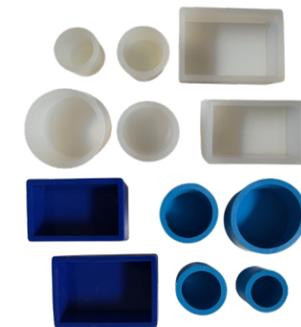
TIP: Polyesters

Polyesters can be submerged into a water bath during curing. This reduces the exotherm heat and thus reduces the shrinkage of the mount at the specimen interface. A secondary advantage is that the water also absorbs the odor.



Castable Mounting Molds

PACE Product Name	Catalog Number	Qty
Reusable Plastic Molds		
1.0-inch reusable two piece plastic mold (12/pkg)	METPREP-0100	12/pkg
1.25-inch reusable two piece plastic mold (12/pkg)	METPREP-0125	12/pkg
1.5-inch reusable two piece plastic mold (12/pkg)	METPREP-0150	12/pkg
2.0-inch reusable two piece plastic mold (12/pkg)	METPREP-0200	12/pkg
Disposable Plastic Molds		
1.0-inch disposable red mount cap - 50/pkg	MOUNT-0100	50/pkg
1.25-inch disposable red mount cap - 50/pkg	MOUNT-0125	50/pkg
1.5-inch disposable red mount cap - 50/pkg	MOUNT-0150	50/pkg



Silicone Rubber Molds

PACE Product Name	Catalog Number		Qty
	Blue Molds	Clear Molds	
Silicone Rubber Molds			
1.0-inch diameter Silicone Rubber Molds - 3/pkg	RMOUNT-0100	RMOUNT-0100C	3/pkg
1.25-inch diameter Silicone Rubber Molds - 3/pkg	RMOUNT-0125	RMOUNT-0125C	3/pkg
1.5-inch diameter Silicone Rubber Molds - 3/pkg	RMOUNT-0150	RMOUNT-0150C	3/pkg
2.0-inch diameter Silicone Rubber Molds - 3/pkg	RMOUNT-0200	RMOUNT-0200C	3/pkg
2.75 x 1-1/2 x 7/8-inch (70 x 39 x 22 mm) Silicone Rubber Molds	RMOUNT-315R	RMOUNT-315C	each
3 x 2 x 7/8-inch (76 x 51 x 22 mm) Silicone Rubber Molds	RMOUNT-302R	RMOUNT-302C	each



Disposable Plastic Molds



Reusable Plastic Molds

Castable Mounting Accessories



STORE-0125

MR-1000



MCUPS-0100



MULTIKLIP

UNIKLIP



Disposable Gloves

PACE Product Name	Catalog Number	Qty
1-gallon castable pump dispenser	ED-3000-01	each
1.25-inch specimen storage container - 25/pkg	STORE-0125	25/pkg
Mold release (8 oz)	MR-1000-08	each
Mold release (16 oz)	MR-1000-16	each
Mixing Cups		
3 oz Graduated Paper Mixing cups (100/pkg)	MCUPS-0100	100/pkg
9 oz Plastic Mixing cups (50/pkg)	PCUPS-050	50/pkg
Vacuum Impregnator Pouring cups (50/pkg)	POUR-CUP-050	50/pkg
Mounting Klips		
Metal MKLIP Spring mounting clip (100/pkg)	MKLIP-0100	100/pkg
Plastic SKLIP Spring mounting clip (100/pkg)	SKLIP-0100	100/pkg
Plastic KLIP specimen mounting clip (100/pkg)	KLIP-0100	100/pkg
Plastic MULTICLIP specimen clips (100/pkg)	MULTICLIP-0100	100/pkg
Plastic UNIKLIP specimen clips (100/pkg)	UNIKLIP-0100	100/pkg
Disposable Gloves		
Small Nitrile Gloves (100/box)	GLOVES-S100	100/pkg
Medium Nitrile Gloves (100/box)	GLOVES-M100	100/pkg
Large Nitrile Gloves (100/box)	GLOVES-L100	100/pkg



PENTA-5000A

PENTA-5000A

Metallographic Hand Grinder

- 5-station hand grinder
- Wet or dry grinding
- Manual grinder
- Easy to change abrasive rolls
- Robust and durable design
- Easy to use
- User friendly
- Low cost
- Easy to service



PENTA-7500S

PENTA-7500S

Metallographic Belt Grinder

- 4-inch x 36-inch belts
- Stainless steel belt adjustment mechanism
- Wet or dry grinding
- Manual grinder
- Planarizing fixture included (individual holders purchased separately)
- Easy to change abrasive belts
- Robust and durable design
- Easy to use



PENTA-7500S Planarizing fixture for metallographic mounts (holders are sold separately)

1-inch Holder	1.25-inch Holder	1.5-inch Holder	2-inch Holder
Catalog no. P75S-SH-100	Catalog no. P75S-SH-125	Catalog no. P75S-SH-150	Catalog no. P75S-SH-200
25 mm Holder	30 mm Holder	40 mm Holder	50 mm Holder
Catalog no. P75S-SH-25	Catalog no. P75S-SH-30	Catalog no. P75S-SH-40	Catalog no. P75S-SH-50



PENTA-7500S & PENTA-5000A YouTube Tutorial at youtube.com/@pacetechnologies

Manual Metallographic Hand Grinder

Model Name	PENTA-5000A
Grinding stations	240, 360, 600, 800 and 1200 grit silicon carbide rolls
Roll sizes	3-7/16-inch width x 60 feet length with 1-inch core
Construction	<ul style="list-style-type: none"> • SMC molding and stainless steel • Hard coat anodized rollers and paper support plates
Cooling rinse system	Water
Dimensions (W x D x H)	22 x 24 x 9-inch (550 mm x 610 mm x 230 mm)
Weight	56 lbs (25 kg)
Catalog Number	PENTA-5000A

Planarizing Metallographic Belt Grinder

Model Name	PENTA-7500S
Single belt	4 x 36-inch (102 x 914 mm)
Electrical Specification	110V / 220V 50/ 60 Hz
Motor power	550 W (3/4-hp)
Cooling / rinse system	Water
Construction	Heavy duty welded steel / fabricated metal / Stainless steel
Dimensions (W x D x H)	20 x 25 x 15-inch (510 x 630 x 380 mm)
Weight	120 lbs (53 kg)
Catalog Number	PENTA-7500S

PENTA-7500S Accessories	Catalog Number
1-inch sample holder for squaring device (each)	P75-SH-100
1.25-inch sample holder for squaring device (each)	P75-SH-125
1.5-inch sample holder for squaring device (each)	P75-SH-150
2-inch sample holder for squaring device (each)	P75-SH-200
25 mm sample holder for squaring device (each)	P75-SH-25
30 mm sample holder for squaring device (each)	P75-SH-30
40 mm sample holder for squaring device (each)	P75-SH-40
50 mm sample holder for squaring device (each)	P75-SH-50

2 year warranty
Limited Warranty

Benefits:

- ◆ 5-grit grinding stations, including one for 800 (P2400) and 1200 (P4000) grit fine SiC abrasives
- ◆ Easy paper advance for maintaining sharp fresh abrasive
- ◆ Low maintenance
- ◆ Simple and easy to use
- ◆ Ideal for low and high volume labs

REQUEST A QUOTE

www.metallographic.com

Benefits:

- ◆ US made 3/4-hp motor (110V or 220V)
- ◆ Heat treated wear surface plate
- ◆ Quick belt changing design
- ◆ Fine adjustment tracking control
- ◆ Specimen holder for sample planarity
- ◆ Sink for rinsing
- ◆ Emergency Stop button

YouTube Tutorials at youtube.com/@pacetechnologies or scan the QR code below



CE Machinery Directive 2006/42/EC
2014/35/ EU Low Voltage Directive
2014/30/EU Electromagnetic Compatibility Directive

Specimen Planar Grinding:

In general, it is better to cut as close to the areas to be investigated than to grind with very coarse abrasives such as 60, 80 and 120 grit grinding papers; however, if the specimen requires coarse abrasive grinding it is HIGHLY recommended that a belt grinder with a planar grinding / squaring fixture be used. The squaring fixture is important so that mounted specimens remain both square and flat.

Note: It is nearly impossible to maintain a square sample by hand on a belt grinder. Square specimen mounts are very important for subsequent specimen preparation on automated single specimen preparation machines. PACE Technologies is the only metallographic equipment manufacturer that offers a planar grinding fixture for its PENTA 7500S belt grinder.



PENTA 7500S Metallographic Belt Grinder

Abrasive Belts (4-inch x 36-inch)



Zirconia (blue), Alumina (red) & Silicon Carbide (black) Abrasive Grinding Belts

PACE Product Name	Catalog Number	Qty
60 grit Zirconia Abrasive Belts	ZRO2-B060	5/pkg
120 grit Zirconia Abrasive Belts	ZRO2-B120	5/pkg
120 grit Alumina Abrasive Belts	ALO-B120	5/pkg
60 grit SiC Abrasive Belts	SIC-B60	10/pkg
80 grit SiC Abrasive Belts	SIC-B80	10/pkg
120 grit SiC Abrasive Belts	SIC-B120	10/pkg
180 grit SiC Abrasive Belts	SIC-B180	10/pkg
240 grit SiC Abrasive Belts	SIC-B240	10/pkg

ABRASIVE BELT TYPE

BENEFIT

Alumina	Hard and durable abrasive, not as sharp as SiC; however, alumina lasts longer than SiC
Silicon Carbide	Very hard and friable. Fast initial cutting, however SiC abrasive breaks down very fast so it is a "short-lived" abrasive
Zirconia	Very durable and hard abrasive. It is a longer lasting abrasive and is an excellent choice for belt grinders. The only drawback is that it requires higher grinding forces as compared to SiC and alumina abrasives



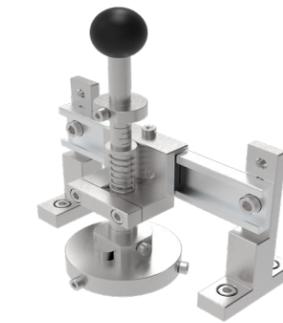
PENTA 5000A Metallographic Hand Grinder

Silicon Carbide (SiC) Abrasive Powders



SiC Abrasive Powders

PACE Product Name	Catalog Number	Qty
120 grit (P120-grit) SiC Powder (1 lb)	SIC-120-P1	1 lb
120 grit (P120-grit) SiC Powder (5 lbs)	SIC-120-P5	5 lbs
240 grit (P280-grit) SiC Powder (1 lb)	SIC-240-P1	1 lb
240 grit (P280-grit) SiC Powder (5 lbs)	SIC-240-P5	5 lbs
320 grit (P400-grit) SiC Powder (1 lb)	SIC-320-P1	1 lb
320 grit (P400-grit) SiC Powder (5 lbs)	SIC-320-P5	5 lbs
400 grit (P800-grit) SiC Powder (1 lb)	SIC-400-P1	1 lb
400 grit (P800-grit) SiC Powder (5 lbs)	SIC-400-P5	5 lbs
600 grit (P1200-grit) SiC Powder (1 lb)	SIC-600-P1	1 lb
600 grit (P1200-grit) SiC Powder (5 lbs)	SIC-600-P5	5 lbs
800 grit (P2400-grit) SiC Powder (1 lb)	SIC-800-P1	1 lb
800 grit (P2400-grit) SiC Powder (5 lbs)	SIC-800-P5	5 lbs
1000 grit (P3000-grit) SiC Powder (1 lb)	SIC-1000-P1	1 lb
1000 grit (P3000-grit) SiC Powder (5 lbs)	SIC-1000-P5	5 lbs
1200 grit (P4000-grit) SiC Powder (1 lb)	SIC-1200-P1	1 lb
1200 grit (P4000-grit) SiC Powder (5 lbs)	SIC-1200-P5	5 lbs



PENTA-7500S Squaring and planarizing holder for metallographic mounts

Silicon Carbide Powders:

The primary application for grinding with silicon carbide particles is in flat lapping operations performed on hard metal plates, such as cast iron.

In metallographic specimen preparation, silicon carbide powders are commonly used for grinding petrographic thin section specimens, where precise material removal and surface flatness are essential.

Silicon Carbide (SiC) Abrasive Rolls (3-7/16-inch width, 60-foot length, 1-inch core)

PACE Product Name	Catalog Number	Qty
120 grit SiC Abrasive Roll (each)	SIC-120R-60	each
240 grit SiC Abrasive Roll (each)	SIC-240R-60	each
320 grit SiC Abrasive Roll (each)	SIC-320R-60	each
360 grit SiC Abrasive Roll (each)	SIC-360R-60	each
400 grit SiC Abrasive Roll (each)	SIC-400R-60	each
600 grit SiC Abrasive Roll (each)	SIC-600R-60	each
800 grit SiC Abrasive Roll (each)	SIC-800R-60	each
1200 grit SiC Abrasive Roll (each)	SIC-1200R-60	each



SiC Abrasive Rolls



NANO-1000S

NANO-1000S

8-10 inch Single Wheel Manual Grinder/Polisher

- Single wheel
- 8 and 10-inch wheel diameter options
- 1 hp dynamic torque servo motor (100-1000 rpm)
- Three programmable preset speeds and time buttons for quick parameter changes
- Easy to use control panel with 3-inch LCD screen
- User friendly and robust



NANO-2000S

NANO-2000S

8-10 inch Dual Wheel Manual Grinder/Polisher

- Dual wheel
- 8 and 10-inch wheel diameter options
- 1 hp dynamic torque servo motor (100-1000 rpm)
- Three programmable preset speeds and time buttons for quick parameter changes
- Easy to use control panel with 3-inch LCD screen
- User friendly and robust

8 & 10-inch Metallographic Polishers

Model Name	NANO-1000S	NANO-2000S
Motor power	1 hp (750 W) dynamic torque servo motor	1 hp (750 W) dynamic torque servo motor
Power head upgrade	FEMTO-1100S / FEMTO-1500S	FEMTO-1100S / FEMTO-1500S
Polishing wheels	Single - 8 & 10-inch diameter	Double - 8 & 10-inch diameter
Electrical specification	110 / 220V (50/60 Hz)	110 / 220V (50/60 Hz)
Speed (rpm)	Variable (100 - 1000 rpm)	Variable (100 - 1000 rpm)
Anodized Working wheels:		
8-inch	Part no. PW-800A	Part no. PW-800A
10-inch	Part no. PW-1000A	Part no. PW-1000A
Dimensions (W x D x H)	16 x 15 x 15-inch (420 x 380 x 380 mm)	30 x 22 x 15-inch (750 x 570 x 380 mm)
Weight	63 lbs (29 kg)	80 lbs (36 kg)
Catalog Number	NANO-1000S	NANO-2000S
Optional	Recirculating filtering tank (RC-1000A)	Recirculating filtering tank (RC-1000A)

NANO-S 8 & 10-inch Polisher Accessories	Catalog Number
8-inch diameter hard coat anodized aluminum working wheel	PW-800A
10-inch diameter hard coat anodized aluminum working wheel	PW-1000A
8 & 10-inch splash guard	PTM-125-001
8 & 10-inch cover	PTM-125-007
8-inch 304 stainless steel plain-backed grinding paper ring	PTM-125-005
10-inch 304 stainless steel plain-backed grinding paper ring	PTM-125-006

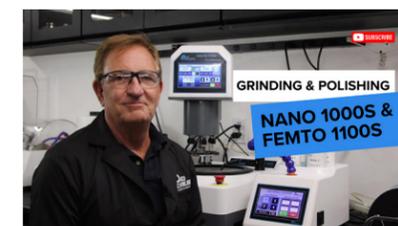
2 year warranty
Limited Warranty

Benefits:

- ◆ Variable speed 100-1000 rpm, 1 rpm increments
- ◆ Clockwise and counter clockwise direction control
- ◆ Rapid programmable speed and time selection
- ◆ Timer (count down to zero and turns off) range from 1 second up to 99 minutes and 60 seconds
- ◆ Emergency stop switch
- ◆ Flexible water spout
- ◆ 1 hp (750W) high torque dynamic servo motor for constant torque over the full range of motor speeds
- ◆ Splash guard and cover
- ◆ Electrical connections for FEMTO-1100S/1500S auto polishing

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8-inch Working Wheel	10-inch Working Wheel	8 / 10-inch Splash Guard
Anodized 8-inch working wheel for NANO-S polishers Catalog no. PW-800A	Anodized 10-inch working wheel for NANO-S polishers Catalog no. PW-1000A	Splash Guard for NANO-S Polisher Catalog no. PTM-125-001
8 / 10-inch Cover	8-inch Paper Ring	10-inch Paper Ring
Polishing wheel cover for NANO-S polishers Catalog no. PTM-125-007	Paper rings for plain-backed papers Catalog no. PTM-125-005 (8-inch)	Paper rings for plain-backed papers Catalog no. PTM-125-006 (10-inch)



NANO-1000S & FEMTO-1100S
YouTube Tutorial at
youtube.com/@pacetechnologies



High Torque Dynamic Servo Motor

CE Machinery Directive 2006/42/EC
2014/35/ EU Low Voltage Directive
2014/30/EU Electromagnetic Compatibility Directive



NANO-1200S

NANO-1200S

12-14 inch Single Wheel Manual Grinder/Polisher

- Single wheel
- 12 and 14-inch wheel diameter options
- 1.3 hp (1000W) motor (100-1000 rpm)
- Three programmable preset speed buttons for quick parameters changes
- Easy to use control panel
- User friendly and robust



12-inch Working Wheel

Anodized 12-inch working wheel for NANO-1200S polishers
Catalog no. PW-1200A



14-inch Working Wheel

Anodized 14-inch working wheel for NANO-1200S polishers
Catalog no. PW-1400A



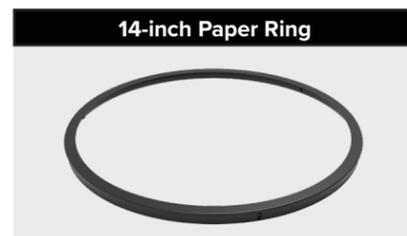
NANO-1200S Splash Guard

Splash Guard for NANO-1200S Polisher
Catalog no. PTM-225-207



12-inch Paper Ring

12-inch Paper ring for plain-backed papers
Catalog no. PTM-225-005 (12-inch)

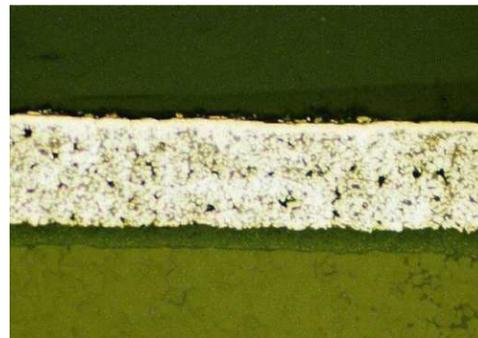


14-inch Paper Ring

14-inch Paper ring for plain-backed papers
Catalog no. PTM-225-006 (14-inch)



SiC particles in a Si₃N₄ matrix , 1000X (DIC)

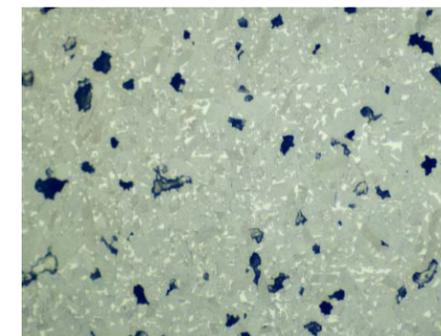


AlN substrate with a molybdenum/ nickel, gold coating
400X (B.F.)

12 & 14-inch Metallographic Polishers

Model Name	NANO-1200S
Motor power	1.3 hp (1000 W)
Power head upgrade	FEMTO-2200S / FEMTO-2500S
Polishing wheels	Single - 12 & 14-inch diameter
Electrical specification	110 or 220V (50/60 Hz) pre wired at factory
Speed (rpm)	Variable (100 - 1000 rpm)
Anodized Working wheels:	
12-inch	Part no. PW-1200A
14-inch	Part no. PW-1400A
Dimensions (W x D x H)	20 x 16 x 25-inch (510 x 420 x 640 mm)
Weight	95 lbs (43 kg)
Catalog Number	NANO-1200S
Optional	Recirculating filtering tank (RC-1000A)

NANO-1200S 12 & 14-inch Polisher Accessories	Catalog Number
12-inch diameter hard coat anodized aluminum working wheel	PW-1200A
14-inch diameter hard coat anodized aluminum working wheel	PW-1400A
12 & 14-inch splash guard	PTM-225-001
12-inch 304 stainless steel plain-backed grinding paper ring	PTM-225-005
14-inch plastic plain-backed grinding paper ring	PTM-225-006



BeO, 400X (B.F.) as polished condition



NANO-1200S / FEMTO-2200S
Autopolisher

2 year warranty
Limited Warranty

Benefits:

- ◆ Variable speed 100-1000 rpm
- ◆ Clockwise and counter clockwise direction control
- ◆ Rapid programmable speed and time selection
- ◆ Integrated timer
- ◆ Emergency stop switch
- ◆ Flexible water spout
- ◆ 1.3 hp (1000W) motor
- ◆ Splash guard
- ◆ Electrical connections for FEMTO-2200S/2500S auto polishing

REQUEST A QUOTE
www.metallographic.com

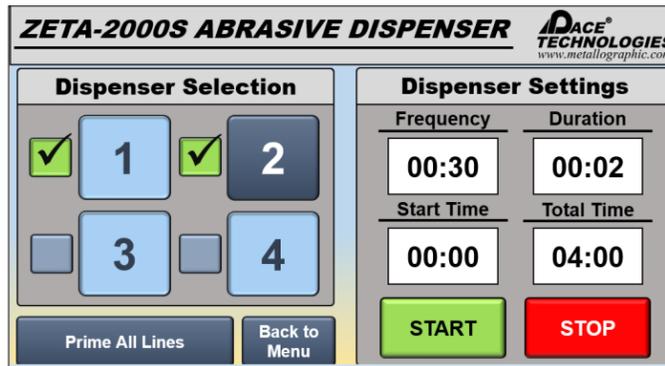
YouTube Tutorials at
youtube.com/@pacetechnologies
or scan the QR code below



Machinery Directive 2006/42/EC
2014/35/ EU Low Voltage Directive
2014/30/EU Electromagnetic Compatibility Directive



ZETA-2000S



ZETA-2000S

Abrasive and Lubricant Dispenser

- 4 (24v) dedicated, programmable peristaltic pumps.
- Setting adjustments for frequency, duration, start time, total time
- 7-inch touchscreen interface
- Compatible with NANO polishing machines as well as competitors' polishing devices
- Controlled priming for each pump and dispensing lines for more immediate application of the abrasive / lubricant
- Flushing/ priming sequence for changing of abrasive/lubricant options
- Variable flow 1.2~90 ml/minute
- Flex line for easy adjustment of dispensing nozzles
- 110/220V compatible
- Easy to use, robust and durable

RC-1000A

Recirculating / Filter System

- Series of three replaceable filters (0.2, 0.5 and 1 micron)
- Positive pressure 24V pump (40W) (connected to 110V/220V power supply)
- 1.3 GPM (5 liters/min) maximum flow
- Easy to operate



RC-1000A

ZETA-2000S Metallographic Abrasive Dispenser



Model Name	ZETA-2000S
Pumps	4 (24v) dedicated, programmable peristaltic pumps Setting adjustments for: - Frequency - Duration - Start time - Total time
Flow rates	1.2 - 90 ml/minute
Electrical specification	110 / 220V (50/60 Hz)
Dimensions (W x D x H)	9.5 x 11 x 12-inch (240 x 270 x 300 mm)
Weight	20 lbs (9.1 kg)
Catalog Number	ZETA-2000S

2 year warranty
Limited Warranty

Benefits:

- ◆ Microprocessor controlled
- ◆ Can be used manually on competitors' equipment
- ◆ Interfaces with the FEMTO-S Auto Polishing heads for automated abrasive fluid dispensing
- ◆ Capable of dispensing NANOMETER alumina and SIAMAT colloidal silica

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RC-1000A Recirculating / Filter System



Model Name	RC-1000A
Filtering	Coarse (2-straining filters) Fine Filters (0.2, 0.5 and 1µm)
Tank capacity	14 gallons (53 L)
Pump	24VDC Diaphragm Pump (1.3 GPM, 5 liters/min)
Electrical specification	110 / 220V (50/60 Hz)
Pressure	60 psi (0.42 MPa)
Dimensions (W x D x H)	32 x 16 x 20-inch (800 x 420 x 500 mm)
Weight	30 lbs (14 kg)
Catalog Number	RC-1000A

2 year warranty
Limited Warranty

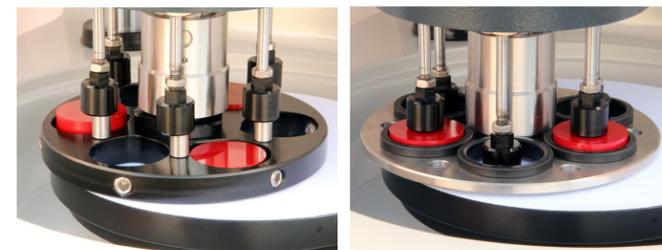
Benefits:

- ◆ Eliminates need for water and drain hook-up
- ◆ Allows the polishing machine to be mobile
- ◆ Environmentally friendly
- ◆ Self-contained system

CE Machinery Directive 2006/42/EC
2014/35/ EU Low Voltage Directive
2014/30/EU Electromagnetic Compatibility Directive



FEMTO-1500S



Central Fixed Force

Individual Force

FEMTO-1500S

Individual / Central Force Autopolishing Head

- FEMTO-1500S is capable of Individual and Central Force
- Compatible with the NANO-1000S and NANO-2000S polishers
- 7-inch touchscreen interface
- 0-300 rpm Variable Speed Head
- High torque dynamic servo motor
- Supports contra or Complementary Direction with NANO-S polisher
- User friendly / Easy to Use
- Robust and Durable



FEMTO-1100S



Individual Force

FEMTO-1100S

Individual Force Autopolishing Head

- FEMTO-1100S is capable of Individual Force
- Compatible with the NANO-1000S and NANO-2000S polishers
- 7-inch touchscreen interface
- 0-300 rpm Variable Speed Head
- High torque dynamic servo motor
- Supports contra or Complementary Direction with NANO-S polisher
- User friendly / Easy to Use
- Robust and Durable

CE Machinery Directive 2006/42/EC
2014/35/ EU Low Voltage Directive
2014/30/EU Electromagnetic Compatibility Directive

FEMTO-1500S Automated Metallographic Polishers

Model Name	NANO-1000S / FEMTO-1500S	NANO-2000S / FEMTO-1500S
Polishing Wheels	8 & 10-inch single wheel	8 & 10-inch double wheel
Force application	Individual pistons (1-6 samples) Central force (3-6 samples)	Individual pistons (1-6 samples) Central force (3-6 samples)
Sample Holder	Quick release chuck	Quick release chuck
Motor power (FEMTO)	0.5 hp (400 W) dynamic torque servo motor	0.5 hp (400 W) dynamic torque servo motor
Motor power (NANO)	1 hp (750 W) dynamic torque servo motor	1 hp (750 W) dynamic torque servo motor
Electrical specification	110 / 220V (50/60 Hz)	110 / 220V (50/60 Hz)
Speed (rpm)	0-300 rpm	0-300 rpm
Relative Head:Base Direction	Complementary and Contra	Complementary and Contra
Dimensions (W x D x H)	16 x 21 x 26-inch (410 x 530 x 670 mm)	29 x 22 x 26-inch (750 x 560 x 670 mm)
Weight	128 lbs (58.2 kg) with polisher base	185 lbs (84 kg) with polisher base
Optional	ZETA-2000S abrasive dispenser	ZETA-2000S abrasive dispenser
Optional	RC-1000A filter/recirculating tank	RC-1000A filter/recirculating tank

FEMTO-1100S Automated Metallographic Polishers

Model Name	NANO-1000S / FEMTO-1100S	NANO-2000S / FEMTO-1100S
Polishing Wheels	8 & 10-inch single wheel	8 & 10-inch double wheel
Force application	Individual pistons (1-6 samples)	Individual pistons (1-6 samples)
Sample Holder	Fixed holder	Fixed holder
Motor power (FEMTO)	0.5 hp (400 W) dynamic torque servo motor	0.5 hp (400 W) dynamic torque servo motor
Motor power (NANO)	1 hp (750 W) dynamic torque servo motor	1 hp (750 W) dynamic torque servo motor
Force	11 - 13.5 lbs (5 - 60 N)	11 - 13.5 lbs (5 - 60 N)
Speed (rpm)	0-300 rpm	0-300 rpm
Relative Head:Base Direction	Complementary and Contra	Complementary and Contra
Electrical specification	110 / 220V (50/60 Hz)	110 / 220V (50/60 Hz)
Dimensions (W x D x H)	16 x 21 x 26-inch (410 x 530 x 670 mm)	29 x 22 x 26-inch (750 x 560 x 670 mm)
Weight	130 lbs (60 kg) with polisher base	185 lbs (85 kg) with polisher base
Optional	ZETA-2000S abrasive dispenser	ZETA-2000S abrasive dispenser
Optional	RC-1000A filter/recirculating tank	RC-1000A filter/recirculating tank

2 year warranty
Limited Warranty

Benefits:

- ◆ Central and Individual polishing force
- ◆ Central force produces flatter specimens, especially useful for specimens having materials of different hardness (e.g. thermal spray coatings, electronic components, heat treated steels, etc.)
- ◆ Individual force procedures require fewer initial grinding steps and the samples can be removed and reinserted without the need to re-planarize
- ◆ Specimens can be polished in both the contra and complementary head / base directions

2 year warranty
Limited Warranty

Benefits:

- ◆ Individual specimen polishing force
- ◆ Reduced number of preparation steps and lower cost for consumables
- ◆ Samples can be re-polished without having to planarize specimens in holder

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FEMTO-1100S/1500S Rings

1-inch or 25 mm Rings	1.25-inch or 30 mm Rings	1.5-inch or 40 mm Rings	2-inch or 50 mm Rings
			
1-inch or 25mm diameter rings for FEMTO-1100S / 1500S (6/set) Catalog no. SR-0100 (1-in) SR-25mm (25mm)	1.25-inch or 30mm diameter rings for FEMTO-1100S / 1500S (6/set) Catalog no. SR-0125 (1.25-in) SR-30mm (30mm)	1.5-inch or 40mm diameter rings for FEMTO-1100S / 1500S (6/set) Catalog no. SR-0150 (1.5-in) SR-40mm (40mm)	2.0-inch or 50mm diameter rings for FEMTO-1100S / 1500S (3/set) Catalog no. SR-0200 (2-in) SR-50mm (50mm)

FEMTO-1100S/1500S Rings	Catalog no.
1-inch Diameter Rings (6/pkg) 25 mm Diameter Rings (6/pkg)	SR-0100 SR-25mm
1.25-inch Diameter Rings (6/pkg) 30 mm Diameter Rings (6/pkg)	SR-0125 SR-30mm
1.5-inch Diameter Rings (6/pkg) 40 mm Diameter Rings (6/pkg)	SR-0150 SR-40mm
2-inch Diameter Rings (3/pkg) 50 mm Diameter Rings (3/pkg)	SR-0200 SR-50mm

FEMTO-1100S/1500S Individual Specimen Holders

6-Ring Sample Holder	3-Ring Sample Holder	Glass Slide Sample Holder
		
individual specimen holder, requires 6 plastic rings ranging from 1-inch up to 1.5-inch or 25 mm up to 40 mm (ordered separately) Catalog no. SH-1100 (FEMTO-1100S) SH-1150 (FEMTO-1500S)	Individual specimen holder, requires 3 plastic rings with 2-inch or 50 mm (ordered separately) Catalog no. SH-1200 (FEMTO-1100S) SH-1250 (FEMTO-1500S)	Individual specimen holder, for use with glass slide fixtures Catalog no. SH-GHOLDER-1100 (FEMTO-1100S) SH-GHOLDER-1500 (FEMTO-1500S)

Individual Specimen Holders	FEMTO-1100S	FEMTO-1500S
Individual Specimen Holder (6-slots for 1-1.5-inch diameter rings)	SH-1100	SH-1150
Individual Specimen Holder (3 slots for 2-inch diameter rings)	SH-1200	SH-1250
Individual Specimen Holder (for use with glass slide fixtures)	SH-GHOLDER-1100	SH-GHOLDER-1500

FEMTO-1500S Central Specimen Holders

1-inch / 25 mm Central Sample Holder	1.25-inch / 30 mm Central Sample Holder	1.5-inch / 40 mm Central Sample Holder	2-inch / 50 mm Central Sample Holder
			
1-inch or 25 mm sample holder Catalog no. QRC-SH100A-1500	1.25-inch or 30 mm sample holder Catalog no. QRC-SH125A-1500	1.5-inch or 40 mm sample holder Catalog no. QRC-SH150A-1500	2-inch or 50 mm sample holder Catalog no. QRC-SH200A-1500

FEMTO-1500S Central Specimen Holders	Catalog no.
1-inch / 25 mm Central Specimen Holder (3-6 samples)	QRC-SH100A-1500
1.25-inch / 30 mm Central Specimen Holder (3-6 samples)	QRC-SH125A-1500
1.5-inch / 40 mm Central Specimen Holder (3-6 samples)	QRC-SH150A-1500
2-inch / 50 mm Central Specimen Holder (3 samples)	QRC-SH200A-1500
2.75 x 1-1/2 x 7/8-inch (70 x 39 x 22 mm) Central Specimen Holder for rectangular molds (2 samples)	QRC-SH315R-1500
3 x 2 x 7/8-inch (76 x 51 x 22 mm) Central Specimen Holder for rectangular molds (2 samples)	QRC-SH302R-1500

Central Sample Holder for Rectangular Molds



Central sample holder for rectangular molds
Catalog no.
QRC-SH315R-1500 (70x39x22mm)
QRC-SH302R-1500 (76x51x22mm)

FEMTO-1100S/1500S Accessories

Quick Release Chuck	Glass Slide Fixture	Central Sample Loading Plate
		
Quick Release Chuck for individual & central specimens Catalog no. QRC (FEMTO-1100S/1500S)	Glass Slide Fixture Catalog no. SR-G (FEMTO-1100S/1500S)	Central Sample Loading Plate Catalog no. CF-LP-1500 (FEMTO-1500S)

FEMTO-1100S/1500S Accessories	FEMTO-1100S	FEMTO-1500S
Quick Release Chuck for Individual & Central Specimens	QRC	QRC
Glass slide fixture for 27 x 47 mm & 1 x 3-inch slides (each)	SR-G	SR-G
Central Force Loading Plate	n.a.	CF-LP-1500



NANO-1200S/FEMTO-2200S

FEMTO-2200S/2500S

Autopolishing Head for Larger Working Areas

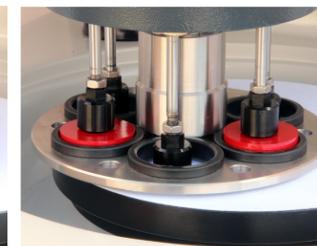
- FEMTO-2500S is capable of Individual and Central Force
- FEMTO-2200S is an Individual force polishing head
- Compatible with the NANO-1200S polisher
- 0-300 rpm Variable Speed Head
- Contra or Complementary Direction
- User friendly / Easy to Use
- Robust and Durable

FEMTO 2200S/2500S Automated Metallographic Polishers

Model Name	NANO-1200S / FEMTO-2500S	NANO-1200S / FEMTO-2200S
Polishing Wheels	12 & 14-inch single wheel	12 & 14-inch single wheel
Force application	Individual pistons (1-6 samples) Central force (3+ samples)	Individual pistons (1-6 samples)
Electrical specification	110 / 220V (50/60 Hz) 1000 W (1.33 hp)	110 / 220V (50/60 Hz) 1000 W (1.33 hp)
Motor power (FEMTO)	0.5 hp (400 W) dynamic torque servo motor	0.5 hp (400 W) dynamic torque servo motor
Motor power (NANO)	1 hp (750 W) dynamic torque servo motor	1 hp (750 W) dynamic torque servo motor
Speed (rpm)	0-300 rpm	0-300 rpm
Relative Head:Base Direction	CW and CCW	CW and CCW
Dimensions (W x D x H)	33 x 27 x 28-inch (845 x 680 x 710 mm)	33 x 27 x 28-inch (845 x 680 x 710 mm)
Weight	150 lbs (68 kg) with polisher base	150 lbs (68 kg) with polisher base
Optional	RC-1000A filter/recirculating tank	RC-1000A filter/recirculating tank



Central Fixed Force



Individual Force

2 year warranty
Limited Warranty

Benefits:

- ◆ Central and Individual polishing force
- ◆ Central force produces flatter specimens, especially useful for specimens having materials of different hardness (e.g. thermal spray coatings, electronic components, heat treated steels, etc.)
- ◆ Individual force procedures require fewer initial grinding steps and the samples can be removed and reinserted without the need to re-planarize
- ◆ Specimens can be polished in both the contra and complementary head / base directions

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Individual vs. Central Force Automated Polishing

APPLICATION	ADVANTAGES	DISADVANTAGES
Individual Force	<ul style="list-style-type: none"> Reduced number of preparation steps and lowers cost for consumables Sample can be re-polished without having to planarize specimens in the holder 	<ul style="list-style-type: none"> Can result in loss of flatness across the specimen if heavy duty coarse grinding is required It is recommended that the grinding and polishing steps only be done at matching head and base speeds with the rotation being in the same direction
Central Force	<ul style="list-style-type: none"> Flatter specimens Specimens can be polished in both the contra and complementary head / base directions 	<ul style="list-style-type: none"> Minimum of 3-samples are required in the holder Typically requires 1-3 additional coarser grinding steps to planarize all specimens Additional grinding steps increase both consumables cost and total preparation time Coarser grinding can result in more surface and subsurface damage to the specimen Need to planarize specimens again if they are removed from the fixed holder

Individual vs. Central Force Typical Preparation Requirements

STEP	INDIVIDUAL FORCE	CENTRAL FORCE
Planar Grinding	n/a	120, 240 grit SiC
Rough Grinding	360, 600 grit SiC	360, 600 grit SiC
Fine Grinding	800, 1200 grit SiC	800, 1200 grit SiC
Intermediate Polishing	1 micron polycrystalline diamond on a woven pad	1 micron polycrystalline diamond on a woven pad
Final Polishing	0.05 micron NANOMETER alumina on a napped pad	0.05 micron NANOMETER alumina on a napped pad

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CE Machinery Directive 2006/42/EC
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2014/30/EU Electromagnetic Compatibility Directive

FEMTO-2200S/2500S Rings

1-inch or 25 mm Rings	1.25-inch or 30 mm Rings	1.5-inch or 40 mm Rings	2-inch or 50 mm Rings
			
1-inch or 25mm diameter rings for FEMTO-2200S / 2500S (6/set) Catalog no. SR-0100 (1-in) SR-25mm (25mm)	1.25-inch or 30mm diameter rings for FEMTO-2200S / 2500S (6/set) Catalog no. SR-0125 (1.25-in) SR-30mm (30mm)	1.5-inch or 40mm diameter rings for FEMTO-2200S / 2500S (6/set) Catalog no. SR-0150 (1.5-in) SR-40mm (40mm)	2.0-inch or 50mm diameter rings for FEMTO-2200S / 2500S (6/set) Catalog no. SR-0200 (2-in) SR-50mm (50mm)

FEMTO-2200S/2500S Rings	Catalog no.
1-inch Diameter Rings (6/pkg) 25 mm Diameter Rings (6/pkg)	SR-0100 SR-25mm
1.25-inch Diameter Rings (6/pkg) 30 mm Diameter Rings (6/pkg)	SR-0125 SR-30mm
1.5-inch Diameter Rings (6/pkg) 40 mm Diameter Rings (6/pkg)	SR-0150 SR-40mm
2-inch Diameter Rings (3/pkg) 50 mm Diameter Rings (3/pkg)	SR-0200 SR-50mm

FEMTO-2500S Central Specimen Holders

1-inch / 25 mm Central Sample Holder	1.25-inch / 30 mm Central Sample Holder	1.5-inch / 40 mm Central Sample Holder	2-inch / 50 mm Central Sample Holder
			
Central 1-inch or 25 mm specimen holder for FEMTO-2500S (3-12 samples) Catalog no. QRC-SH100A-2500	Central 1.25-inch or 30 mm specimen holder for FEMTO-2500S (3-12 samples) Catalog no. QRC-SH125A-2500	Central 1.5-inch or 40 mm specimen holder for FEMTO-2500S (3-6 samples) Catalog no. QRC-SH150A-2500	Central 2.0-inch or 50 mm specimen holder for FEMTO-2500S (3-6 samples) Catalog no. QRC-SH200A-2500

Central Specimen Holder	Catalog no.
1-inch / 25 mm central specimen holder (3-12 samples)	QRC-SH100A-2500
1.25-inch / 30 mm central specimen holder (3-12 samples)	QRC-SH125A-2500
1.5-inch / 40 mm central specimen holder (3-6 samples)	QRC-SH150A-2500
2-inch / 50 mm central specimen holder (3-6 samples)	QRC-SH200A-2500

FEMTO-2200S/2500S Individual Specimen Holders

1 to 1.5-inch / 25 to 40 mm Sample Holder	2-inch / 50 mm Sample Holder	Glass Slide Sample Holder
		
Individual specimen holder, requires 6 rings ranging from 1-inch up to 1.5-inch or 25 mm up to 40 mm (ordered separately) Catalog no. SH-2100 (FEMTO-2200) SH-2150 (FEMTO-2500)	Individual specimen holder, requires 6, 2-inch or 50 mm rings (ordered separately) Catalog no. SH-2200 (FEMTO-2200) SH-2250 (FEMTO-2500)	Individual specimen holder for glass slide fixtures Catalog no. SH-GHOLDER-2200 (FEMTO-2200) SH-GHOLDER-2250 (FEMTO-2500)

Individual Specimen Holder	FEMTO-2200S	FEMTO-2500S
Individual Specimen Holder (6-slots for 1 to 1.5-inch or 25-40 mm mounts)	SH-2100	SH-2150
Individual Specimen Holder (6-slots for 2-inch or 50 mm mounts)	SH-2200	SH-2250
Individual Specimen Holder for glass slide fixtures	SH-GHOLDER-2200	SH-GHOLDER-2500

FEMTO-2200S/2500S Accessories

Glass Slide Fixture	Quick Release Chuck	Central Sample Loading Plate
		
Glass Slide Fixture Catalog no. SR-G (FEMTO-2200S) SR-G (FEMTO-2500S)	Quick Release Chuck for individual & central specimens Catalog no. QRC (FEMTO-2200S) QRC (FEMTO-2500S)	Central Force Loading Plate Catalog no. CF-LP-2500 (FEMTO-2500S)

FEMTO-2200S/2500S Accessories	FEMTO-2200S	FEMTO-2500S
Quick Release Chuck for Individual & Central Specimens	QRC	QRC
Glass slide fixture for 27 x 47 mm & 1 x 3-inch slides (each)	SR-G	SR-G
Central Force Loading Plate	n.a.-	CF-LP-2500

CONTROLLED REMOVAL POLISHER



ATTO-1000S

Controlled Removal Micro-Polisher

- Ideal for high-resolution microscopy (optical, SEM, FIB, TEM, AFM)
- Enables precise control and tracking of material removal
- 7-inch touchscreen with 16 pre-set grinding/polishing parameters and customizable settings
- Fine adjustments via pitch and roll micrometers ensure optimal sample flatness and alignment with the abrasive plane
- Accepts both 8-inch and 10-inch working wheels

Model Name	ATTO-1000S
Power	750W (1 hp), 110V/220V 50/60 Hz
Speed (rpm)	0-350 rpm
Grinding Disc Diameter	8 or 10-inch
Rotating Direction	10 mm

GRINDING HEAD	ATTO-1000S
Head Speed (rpm)	0-150 rpm (1 rpm increments)
Rotation Direction	Clockwise / Counter-clockwise
Sample Semi-rotation	0-50 rpm
Swing	Adjustable Speed
Sample Load	0-300 grams
Vertical Positioning Resolution	1 micron
Torque	0.8 N/M
Maximum Removal	10 mm

PARAMETERS	ATTO-1000S
Operating Temperature	-20°C (-4°F) - 60°C (140°F)
Operating Humidity	0-95% Relative Humidity
Dimension (W*D*H)	27.6 x 16.9 x 22.8-inch (700 x 430 x 580 mm)
Weight	125.7 lbs (57kg)
Abrasive & Lubricant Dispenser (Optional)	4 (24V) Programmable peristaltic pumps, see information for ZETA-2000S
Catalog Number	ATTO-1000S

TIP:

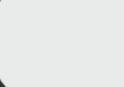
- ◆ Take your sample preparation to the next level by pairing our Premium Diamond Lapping Films with the precision of the ATTO-1000S Micro-Polisher. This combination is designed to deliver the surface quality and consistency needed for advanced material analysis.

2 year warranty
Limited Warranty

Benefits:

- ◆ Micron-level precision and accuracy
- ◆ Real-time monitoring with 0.2 µm resolution
- ◆ Programmable touchscreen interface
- ◆ Dual micrometers for tilt control
- ◆ Flexible operation with speed & rotation control
- ◆ Compatible with 8-inch and 10-inch working wheels
- ◆ Compact and lab-ready design

REQUEST A QUOTE
www.metallographic.com

 <p>2.8 x 1 x 2.7 inches (73 x 26 x 69 mm) Catalog no. A1S-A-PAF</p>	 <p>40 mm sample capacity Catalog no. A1S-A-TF</p>	 <p>2.3 x 1.7 x 1.7 inches (59 x 43 x 43 mm) Catalog no. A1S-A-MF</p>	 <p>0.7 x 0.7 x 1.7 inches (20 x 18 x 43 mm) Catalog no. A1S-A-CSCF</p>
 <p>0.7 x 0.7 x 0.8 (18 x 18 x 22 mm) Catalog no. A1S-A-CSAF</p>	 <p>Catalog no. A1S-A-PW-8</p>	 <p>Catalog no. A1S-A-PW-10</p>	 <p>Catalog no. A1S-A-RDB</p>



CE Machinery Directive 2006/42/EC
2014/35/ EU Low Voltage Directive
2014/30/EU Electromagnetic Compatibility Directive



GIGA-S

Vibratory Polisher

- Interchangeable bowl for the ability to polish on a 9 or 12-inch surface
- Utilizes a piezoelectric (PZT) motor for true electronic vibration
- Magnetic locking bowl attachment for quick cleaning and change out of polishing medium
- Two part bowl design for leak free operation
- New Pulse Mode feature for stain free polishing if left unattended after procedure has ended
- Removable, hinged lid for easy cleaning
- Simple to use
- Robust and Durable

GIGA-S Vibratory Metallographic Polishers

Model Name	GIGA-S
Polishing Bowl size	9 or 12-inch
Drive Mechanism	PZT Motor
Electrical specification	110 / 220V (50/60 Hz)
Construction	Aluminum casting with SMC cover (injection molded)
Frequency	0~220Hz
Motor voltage	200V (600 W)
Dimensions (W x D x H) (note: hood can also be removed)	Hood closed: 16 x 20 x 16-inch (420 x 500 x 410 mm) Hood open: 16 x 20 x 30-inch (420 x 500 x 750 mm)
Weight	135 lbs (62 kg)

2 year warranty
Limited Warranty

Benefits:

- ◆ Superior surface finishes
- ◆ Eliminates subsurface damage (has been shown to produce exceptional surface finish for EBSD sample preparation)
- ◆ Able to polish multiple samples simultaneously
- ◆ With correct CMP polishing abrasive, flatter or more planar finishes can be obtained over materials having a wide range of hardness!

REQUEST A QUOTE
www.metallographic.com

GIGA-S

1-inch Holders



1-inch diameter GIGA holder
Catalog no. VIB-0100

1.25-inch Holders



1.25-inch diameter GIGA holder
Catalog no. VIB-0125

1.5-inch Holders



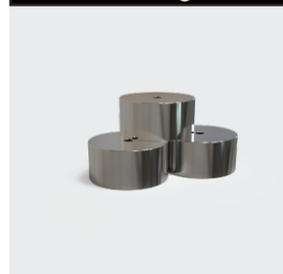
1.5-inch diameter GIGA holder
Catalog no. VIB-0150

2-inch Holders



2-inch diameter GIGA holder
Catalog no. VIB-0200

1-inch Weights



1-inch diameter GIGA weight
Catalog no. VIB-WT-0100

1.25-inch Weights



1.25-inch diameter GIGA weight
Catalog no. VIB-WT-0125

1.5-inch Weights



1.5-inch diameter GIGA weight
Catalog no. VIB-WT-0150

2-inch Weights



2-inch diameter GIGA weight
Catalog no. VIB-WT-0200

1.0/ 1.25-inch Mounting Plate



Mounting plate for 1 & 1.25-inch specimen holders
Catalog no. PLATE-0100

1.5 / 2.0-inch Mounting Plate



Mounting plate for 1.5 & 2-inch specimen holders
Catalog no. PLATE-0200

Plastic 9 & 12-inch Polishing Bowls



Plastic 2-piece Interchangeable GIGA-S Polishing Bowls

Anodized Aluminum 9 & 12-inch Polishing Bowls



Anodized Aluminum 2-piece Interchangeable GIGA-S Polishing Bowls

Vibratory Polishing Holder Catalog Number

1-inch diameter 304 stainless steel specimen holders (each)	VIB-0100
1.25-inch diameter 304 stainless steel specimen holders (each)	VIB-0125
1.5-inch diameter 304 stainless steel specimen holders (each)	VIB-0150
2-inch diameter 304 stainless steel specimen holders (each)	VIB-0200
1-inch weight, 304 stainless steel (each)	VIB-WT-0100
1.25-inch weight, 304 stainless steel (each)	VIB-WT-0125
1.5-inch weight, 304 stainless steel (each)	VIB-WT-0150
2-inch weights 304 stainless steel (each)	VIB-WT-0200
Mounting plate for 1-inch and 1.25-inch holders	PLATE-0100
Mounting plate for 1.5-inch and 2-inch holders	PLATE-0200
9-inch plastic Interchangeable bowl	GS-9IN-BOWL
12-inch plastic Interchangeable bowl	GS-12IN-BOWL
9-inch aluminum Interchangeable bowl	GS-9IN-BOWL-AL
12-inch aluminum Interchangeable bowl	GS-12IN-BOWL-AL



Machinery Directive 2006/42/EC
2014/35/ EU Low Voltage Directive
2014/30/EU Electromagnetic Compatibility Directive

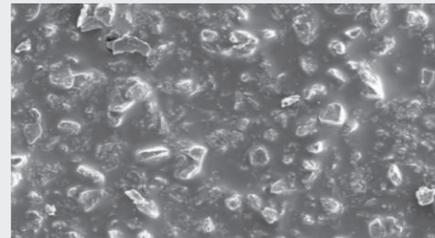
Silicon Carbide Abrasives:

SiC is a manufactured abrasive produced by a high temperature reaction between silica and carbon. It has a hexagonal-rhombohedral crystal structure and a hardness of approximately 2500 HV. It is an ideal abrasive for cutting and grinding metallographic specimens because of its high hardness and sharp edges. It is also somewhat brittle, and therefore it cleaves easily to produce sharp new edges (self sharpening). SiC is an excellent abrasive for maximizing cutting rates while minimizing surface and subsurface damage. For metallographic preparation, SiC abrasives are used in abrasive blades and for coated abrasive grinding papers ranging from very coarse 60 grit to very fine 1200 (P4000) grit sizes.

Bonded or coated abrasive papers of SiC are designed so that the abrasive will have a large number of cutting points (negative abrasive rank angle). This is achieved by aligning the abrasive particles approximately normal to the backing. Note that coated abrasives are not quite coplanar, thus SiC papers produce the maximum efficiency (cut rate, stock removal and minimal damage) because new abrasive is exposed as the old abrasive breaks down.

SiC Grinding Characteristics:

- Easy to use
- Repeatable
- Relatively lower cost to other options
- Available with and without a pressure sensitive adhesive (PSA) backing



Standard Abrasive Grit Conversion (US to European)

US Standard Grit	60	120	180	240	320	360	400	600	800	1200
European P-Grading	P60	P120	P180	P220	P360	P500	P800	P1200	P2400	P4000
Medium Particle Size (µm)	250	106	75	63	40.5	30.2	21.8	15.3	6.5	2.5

8-inch SiC Papers with Adhesive Backing, PSA (25/pkg)



120 grit 8-inch SiC Paper with PSA (25/pkg)
Catalog no. SIC-120P8-25

PACE Product Name	Catalog Number	Qty
8-inch Combo Pack (5 each - 240, 360, 600, 800, 1200 grit SiC) (PSA)	SIC-P08C	5 each
8-inch 60 grit SiC (PSA)-25/pkg	SIC-060P8-25	25/pkg
8-inch 80 grit SiC (PSA)-25/pkg	SIC-080P8-25	25/pkg
8-inch 120 grit SiC (PSA)-25/pkg	SIC-120P8-25	25/pkg
8-inch 180 grit SiC (PSA)-25/pkg	SIC-180P8-25	25/pkg
8-inch 240 grit SiC (PSA)-25/pkg	SIC-240P8-25	25/pkg
8-inch 320 grit SiC (PSA)-25/pkg	SIC-320P8-25	25/pkg
8-inch 360 grit SiC (PSA)-25/pkg	SIC-360P8-25	25/pkg
8-inch 400 grit SiC (PSA)-25/pkg	SIC-400P8-25	25/pkg
8-inch 600 grit SiC (PSA)-25/pkg	SIC-600P8-25	25/pkg
8-inch 800 grit SiC (PSA)-25/pkg	SIC-800P8-25	25/pkg
8-inch 1000 grit SiC (PSA)-25/pkg	SIC-1000P8-25	25/pkg
8-inch 1200 grit SiC (PSA)-25/pkg	SIC-1200P8-25	25/pkg

8-inch Premium SiC Papers with Adhesive Backing, PSA (50/pkg)



1200 grit 8-inch SiC Paper with PSA (50/pkg)
Catalog no. SIC-1200P8-50

PACE Product Name	Catalog Number	Qty
8-inch 60 grit Premium (PSA)-50/pkg	SIC-060P8-50	50/pkg
8-inch 80 grit Premium (PSA)-50/pkg	SIC-080P8-50	50/pkg
8-inch 120 grit Premium (PSA)-50/pkg	SIC-120P8-50	50/pkg
8-inch 180 grit Premium (PSA)-50/pkg	SIC-180P8-50	50/pkg
8-inch 240 / P220 grit Premium (PSA)-50/pkg	SIC-240P8-50	50/pkg
8-inch 320 / P400 grit Premium (PSA)-50/pkg	SIC-320P8-50	50/pkg
8-inch 360 / P500 grit Premium (PSA)-50/pkg	SIC-360P8-50	50/pkg
8-inch 400 / P800 grit Premium (PSA)-50/pkg	SIC-400P8-50	50/pkg
8-inch 600 / P1200 grit Premium (PSA)-50/pkg	SIC-600P8-50	50/pkg
8-inch 800 / P2400 grit Premium (PSA)-50/pkg	SIC-800P8-50	50/pkg
8-inch 1000 / P3000 grit Premium (PSA)-50/pkg	SIC-1000P8-50	50/pkg
8-inch 1200 / P4000 grit Premium (PSA)-50/pkg	SIC-1200P8-50	50/pkg

8-inch SiC Papers with Adhesive Backing, PSA (100/pkg)



1200 grit 8-inch SiC Paper with PSA (100/pkg)
Catalog no. SIC-1200P8-100

PACE Product Name	Catalog Number	Qty
8-inch 60 grit SiC (PSA)-100/pkg	SIC-060P8-100	100/pkg
8-inch 80 grit SiC (PSA)-100/pkg	SIC-080P8-100	100/pkg
8-inch 120 grit SiC (PSA)-100/pkg	SIC-120P8-100	100/pkg
8-inch 180 grit SiC (PSA)-100/pkg	SIC-180P8-100	100/pkg
8-inch 240 grit SiC (PSA)-100/pkg	SIC-240P8-100	100/pkg
8-inch 320 grit SiC (PSA)-100/pkg	SIC-320P8-100	100/pkg
8-inch 360 grit SiC (PSA)-100/pkg	SIC-360P8-100	100/pkg
8-inch 400 grit SiC (PSA)-100/pkg	SIC-400P8-100	100/pkg
8-inch 600 grit SiC (PSA)-100/pkg	SIC-600P8-100	100/pkg
8-inch 800 grit SiC (PSA)-100/pkg	SIC-800P8-100	100/pkg
8-inch 1000 grit SiC (PSA)-100/pkg	SIC-1000P8-100	100/pkg
8-inch 1200 grit SiC (PSA)-100/pkg	SIC-1200P8-100	100/pkg

8-inch SILICON CARBIDE ABRASIVE PAPER

8-inch Premium SiC Papers Plain-backed Non-Adhesive Backed (50/pkg)



360 grit 8-inch SiC Plain-backed Paper (50/pkg)
Catalog no. SIC-2208-360

PACE Product Name	Catalog Number	Qty
8-inch 60 grit Premium (Plain)-50/pkg	SIC-2208-060	50/pkg
8-inch 80 grit Premium (Plain)-50/pkg	SIC-2208-080	50/pkg
8-inch 120 grit Premium (Plain)-50/pkg	SIC-2208-120	50/pkg
8-inch 180 grit Premium (Plain)-50/pkg	SIC-2208-180	50/pkg
8-inch 240 / P220 grit Premium (Plain)-50/pkg	SIC-2208-240	50/pkg
8-inch 320 / P400 grit Premium (Plain)-50/pkg	SIC-2208-320	50/pkg
8-inch 360 / P500 grit Premium (Plain)-50/pkg	SIC-2208-360	50/pkg
8-inch 400 / P800 grit Premium (Plain)-50/pkg	SIC-2208-400	50/pkg
8-inch 600 / P1200 grit Premium (Plain)-50/pkg	SIC-2208-600	50/pkg
8-inch 800 / P2400 grit Premium (Plain)-50/pkg	SIC-2208-800	50/pkg
8-inch 1000 / P3000 grit Premium (Plain)-50/pkg	SIC-2208-1000	50/pkg
8-inch 1200 / P4000 grit Premium (Plain)-50/pkg	SIC-2208-1200	50/pkg
8-inch Double-sided adhesive -10/pkg	DSA-08	10/pkg

8-inch SiC Papers Plain-backed Non-Adhesive Backed (100/pkg)

PACE Product Name	Catalog Number	Qty
8-inch 60 grit SiC (Plain)-100/pkg	SIC-2108-060	100/pkg
8-inch 80 grit SiC (Plain)-100/pkg	SIC-2108-080	100/pkg
8-inch 120 grit SiC (Plain)-100/pkg	SIC-2108-120	100/pkg
8-inch 180 grit SiC (Plain)-100/pkg	SIC-2108-180	100/pkg
8-inch 240 grit SiC (Plain)-100/pkg	SIC-2108-240	100/pkg
8-inch 320 grit SiC (Plain)-100/pkg	SIC-2108-320	100/pkg
8-inch 360 grit SiC (Plain)-100/pkg	SIC-2108-360	100/pkg
8-inch 400 grit SiC (Plain)-100/pkg	SIC-2108-400	100/pkg
8-inch 600 grit SiC (Plain)-100/pkg	SIC-2108-600	100/pkg
8-inch 800 grit SiC (Plain)-100/pkg	SIC-2108-800	100/pkg
8-inch 1000 grit SiC (Plain)-100/pkg	SIC-2108-1000	100/pkg
8-inch 1200 grit SiC (Plain)-100/pkg	SIC-2108-1200	100/pkg
8-inch Double-sided adhesive -10/pkg	DSA-08	10/pkg



360 grit 8-inch SiC Plain-backed Paper (100/pkg)
Catalog no. SIC-2108-360

Abrasive Grinding

Process Description

The machining parameters which affect the preparation of metallographic specimens include: grinding/polishing pressure, relative velocity distribution and the direction of grinding/polishing.

Preston's Equation has been used to describe the mechanical contributions of pressure and velocity to removal rates. Preston's Equation states that the removal rate is proportional to the velocity times the pressure.

Preston's Equation $R = kPV$

R= material removal rate

k= Preston coefficient

P= normal lapping force

V= relative tangential velocity between the lapping plate and work piece

Grinding Pressure

Grinding and polishing pressure is dependent upon the applied force (pounds or Newtons) and the area of the specimen and mounting material. Pressure is defined as the Force/Area (psi, N/m² or Pa). For specimens significantly harder than the mounting compound, pressure is better defined as the force divided by the specimen surface area. Thus, for larger hard specimens higher grinding/polishing pressures increase stock removal rates, however higher pressure also increases the amount of surface and subsurface damage. Note for SiC grinding papers, as the abrasive grains dull and cut rates decrease, increasing grinding pressures can extend the life of the SiC paper.

Higher grinding and polishing pressures can also generate additional frictional heat which may actually be beneficial for the chemical mechanical polishing (CMP) of ceramics, minerals and composites. Likewise for extremely friable specimens such as nodular cast iron, higher pressures and lower relative velocity distributions can aid in retaining inclusions and secondary phases.

Grinding Direction

The orientation of the specimen can have a significant impact on the preparation results, especially for specimens with coatings. In general, when grinding and polishing materials with coatings the brittle component should be kept in compression. In other words, for brittle coatings the direction of the abrasive should be through the coating and into the substrate. Conversely, for brittle substrates with ductile coatings, the direction of the abrasive should be through the brittle substrate into the ductile coating.



Proper alignment and machine conditions produce flat planar samples

Improper alignment and machine conditions produce MRD

Material Removal Differential (MRD)

The term MRD (material removal differential) has been used to describe the negative affect that occurs when the sample does not grind equally across the entire surface of the sample and to some extent the entire surface of the sample mount (see example).

A number of factors contribute the MRD, these include:

- Uneven wear on the abrasive paper, film or foil
- Mount does not track over the edge and/or center of the grinding paper
- Wide range in velocity distributions (contra direction)
- Large differences in hardness between the mount and the sample

MRD is typically more pronounced for SiC papers as the SiC abrasive is very hard and brittle and breaks down relatively fast.

To eliminate MRD:

- Align the sample holder on the FEMTO polishing head so that the sample tracks across the entire radius of the grinding paper.
- Rotate the FEMTO and NANO head at the same velocity and in the same direction.

10-inch SILICON CARBIDE ABRASIVE PAPERS

Silicon Carbide Converter:

PACE Technologies is an actual metallographic supplier that converts its own SiC papers, which provides better quality control, distribution and flexibility for supplying metallographic silicon carbide papers.



SiC Conversion Characteristics:

- ◆ PSA laminating
- ◆ Die cutting
- ◆ Relatively lower cost to produce
- ◆ Focus on metallographic vs. industrial graded products

10-inch Premium SiC Papers with Adhesive Backing, PSA (50/pkg)



240 grit 10-inch SiC Paper with PSA (50/pkg)
Catalog no. SIC-240P10-50

PACE Product Name	Catalog Number	Qty
10-inch 60 grit Premium (PSA)-50/pkg	SIC-060P10-50	50/pkg
10-inch 80 grit Premium (PSA)-50/pkg	SIC-080P10-50	50/pkg
10-inch 120 grit Premium (PSA)-50/pkg	SIC-120P10-50	50/pkg
10-inch 180 grit Premium (PSA)-50/pkg	SIC-180P10-50	50/pkg
10-inch 240 / P220 grit Premium (PSA)-50/pkg	SIC-240P10-50	50/pkg
10-inch 320 / P400 grit Premium (PSA)-50/pkg	SIC-320P10-50	50/pkg
10-inch 360 / P400 grit Premium (PSA)-50/pkg	SIC-360P10-50	50/pkg
10-inch 400 / P800 grit Premium (PSA)-50/pkg	SIC-400P10-50	50/pkg
10-inch 600 / P1200 grit Premium (PSA)-50/pkg	SIC-600P10-50	50/pkg
10-inch 800 / P2400 grit Premium (PSA)-50/pkg	SIC-800P10-50	50/pkg
10-inch 1000 / P3000 grit Premium (PSA)-50/pkg	SIC-1000P10-50	50/pkg
10-inch 1200 / P4000 grit Premium (PSA)-50/pkg	SIC-1200P10-50	50/pkg

10-inch SiC Papers with Adhesive Backing, PSA (25/pkg)



60 grit 10-inch SiC Paper with PSA (25/pkg)
Catalog no. SIC-060P10-25

PACE Product Name	Catalog Number	Qty
10-inch Combo Pack (5 each - 240, 360, 600, 800, 1200 grit SiC) (PSA)	SIC-P10C	5 each
10-inch 60 grit SiC (PSA)-25/pkg	SIC-060P10-25	25/pkg
10-inch 80 grit SiC (PSA)-25/pkg	SIC-080P10-25	25/pkg
10-inch 120 grit SiC (PSA)-25/pkg	SIC-120P10-25	25/pkg
10-inch 180 grit SiC (PSA)-25/pkg	SIC-180P10-25	25/pkg
10-inch 240 grit SiC (PSA)-25/pkg	SIC-240P10-25	25/pkg
10-inch 320 grit SiC (PSA)-25/pkg	SIC-320P10-25	25/pkg
10-inch 360 grit SiC (PSA)-25/pkg	SIC-360P10-25	25/pkg
10-inch 400 grit SiC (PSA)-25/pkg	SIC-400P10-25	25/pkg
10-inch 600 grit SiC (PSA)-25/pkg	SIC-600P10-25	25/pkg
10-inch 800 grit SiC (PSA)-25/pkg	SIC-800P10-25	25/pkg
10-inch 1000 grit SiC (PSA)-25/pkg	SIC-1000P10-25	25/pkg
10-inch 1200 grit SiC (PSA)-25/pkg	SIC-1200P10-25	25/pkg

10-inch SiC Papers with Adhesive Backing, PSA (100/pkg)



240 grit 10-inch SiC Paper with PSA (100/pkg)
Catalog no. SIC-240P10-100

PACE Product Name	Catalog Number	Qty
10-inch 60 grit SiC (PSA)-100/pkg	SIC-060P10-100	100/pkg
10-inch 80 grit SiC (PSA)-100/pkg	SIC-080P10-100	100/pkg
10-inch 120 grit SiC (PSA)-100/pkg	SIC-120P10-100	100/pkg
10-inch 180 grit SiC (PSA)-100/pkg	SIC-180P10-100	100/pkg
10-inch 240 grit SiC (PSA)-100/pkg	SIC-240P10-100	100/pkg
10-inch 320 grit SiC (PSA)-100/pkg	SIC-320P10-100	100/pkg
10-inch 360 grit SiC (PSA)-100/pkg	SIC-360P10-100	100/pkg
10-inch 400 grit SiC (PSA)-100/pkg	SIC-400P10-100	100/pkg
10-inch 600 grit SiC (PSA)-100/pkg	SIC-600P10-100	100/pkg
10-inch 800 grit SiC (PSA)-100/pkg	SIC-800P10-100	100/pkg
10-inch 1000 grit SiC (PSA)-100/pkg	SIC-1000P10-100	100/pkg
10-inch 1200 grit SiC (PSA)-100/pkg	SIC-1200P10-100	100/pkg

10-inch SILICON CARBIDE ABRASIVE PAPERS

Grinding Relative Velocity

Current autopolishing grinding and polishing machines are designed with the specimens mounted in a disk holder and machined on a disk platen surface. This disk on disk rotation allows for a variable velocity distribution depending upon the head speed relative to the base speed.

NOTE: Matching the head and base speed, while running in the same direction produces better flatness and lower surface damage because this minimizes the velocity distribution across the sample as it rotates.

For high stock removal, a slower head speed relative to a higher base speed produces the most aggressive grinding and polishing operation. The drawback to high velocity distributions is that the abrasive (especially SiC papers) may not breakdown uniformly, this can result in non-uniform removal across the specimen surface. Another disadvantage is that the high velocity distributions can create

substantially more specimen damage, especially in brittle phases. In all cases, it is not recommended to have the head rotating contra direction to the base because of the non-uniform removal and abrasive break-down which occurs.

Minimal relative velocity distributions can be obtained by rotating the head specimen disk at the same rpm and same direction as the base platen with the wheel off center to each other. This condition is best for retaining inclusions and brittle phases as well as for obtaining a uniform finish across the entire specimen. The disadvantage to low relative velocity distributions is that stock removal rates can be quite low.

In practice, the best condition to run the polishing machine is by matching the head and base speeds at 200-300 rpm and in the same direction. For polishing it is recommended that the speed be reduce to 100/100 rpm base/head speed. For final polishing under chemical mechanical polishing (CMP) conditions where frictional heat can enhance the chemical process, high speeds and high relative velocity distributions can be useful as long as brittle phases are not present (e.g. monolithic ceramics such as silicon nitride and alumina).

250 mm (~10-inch) Premium SiC Papers Plain-backed Non-Adhesive Backed (50/pkg)



800 grit 10-inch SiC Plain-backed Paper (50/pkg)
Catalog no. SIC-2210-800

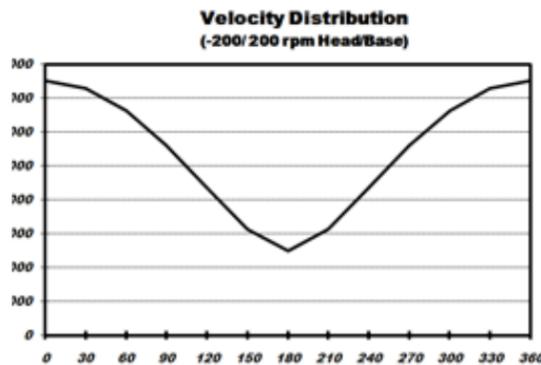
PACE Product Name	Catalog Number	Qty
10-inch 60 grit Premium (Plain)-50/pkg	SIC-2210-060	50/pkg
10-inch 80 grit Premium (Plain)-50/pkg	SIC-2210-080	50/pkg
10-inch 120 grit Premium (Plain)-50/pkg	SIC-2210-120	50/pkg
10-inch 180 grit Premium (Plain)-50/pkg	SIC-2210-180	50/pkg
10-inch 240 / P220 grit Premium (Plain)-50/pkg	SIC-2210-240	50/pkg
10-inch 320 / P400 grit Premium (Plain)-50/pkg	SIC-2210-320	50/pkg
10-inch 360 / P500 grit Premium (Plain)-50/pkg	SIC-2210-360	50/pkg
10-inch 400 / P800 grit Premium (Plain)-50/pkg	SIC-2210-400	50/pkg
10-inch 600 / P1200 grit Premium (Plain)-50/pkg	SIC-2210-600	50/pkg
10-inch 800 / P2400 grit Premium (Plain)-50/pkg	SIC-2210-800	50/pkg
10-inch 1000 / P3000 grit Premium (Plain)-50/pkg	SIC-2210-1000	50/pkg
10-inch 1200 / P4000 grit Premium (Plain)-50/pkg	SIC-2210-1200	50/pkg
10-inch Double-sided adhesive -10/pkg	DSA-10	10/pkg

250 mm (~10-inch) SiC Papers Plain-backed Non-Adhesive Backed (100/pkg)

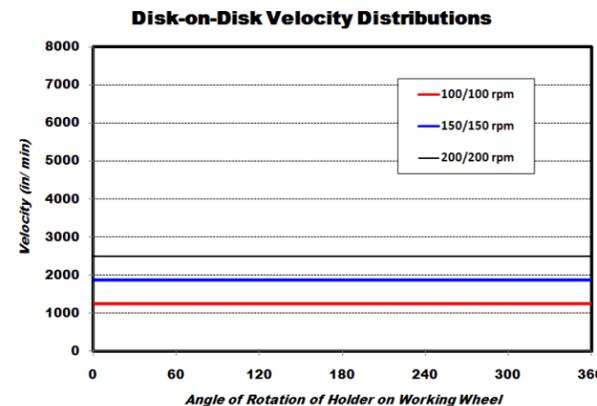


800 grit 10-inch SiC Plain-backed Paper (100/pkg)
Catalog no. SIC-2110-800

PACE Product Name	Catalog Number	Qty
10-inch 60 grit SiC (Plain)-100/pkg	SIC-2110-060	100/pkg
10-inch 80 grit SiC (Plain)-100/pkg	SIC-2110-080	100/pkg
10-inch 120 grit SiC (Plain)-100/pkg	SIC-2110-120	100/pkg
10-inch 180 grit SiC (Plain)-100/pkg	SIC-2110-180	100/pkg
10-inch 240 grit SiC (Plain)-100/pkg	SIC-2110-240	100/pkg
10-inch 320 grit SiC (Plain)-100/pkg	SIC-2110-320	100/pkg
10-inch 360 grit SiC (Plain)-100/pkg	SIC-2110-360	100/pkg
10-inch 400 grit SiC (Plain)-100/pkg	SIC-2110-400	100/pkg
10-inch 600 grit SiC (Plain)-100/pkg	SIC-2110-600	100/pkg
10-inch 800 grit SiC (Plain)-100/pkg	SIC-2110-800	100/pkg
10-inch 1000 grit SiC (Plain)-100/pkg	SIC-2110-1000	100/pkg
10-inch 1200 grit SiC (Plain)-100/pkg	SIC-2110-1200	100/pkg
10-inch Double-sided adhesive -10/pkg	DSA-10	10/pkg



High relative velocity distribution for non-matching head and base speeds.



Constant relative velocity distribution for-matching head and base speeds

Head Speed (rpm)	Base Speed (rpm)	Relative Velocity Distribution	Characteristic	Application
100-150	300-600	High	-Aggressive stock removal -Differential grinding across the specimen surface	Useful for gross removal on hard specimens
200-300	200-300	Low	-Matching head and base speed in the same direction eliminates relative velocity distributions -Uniform stock removal -Low stock removal -Produces minimal damage	-Provides superior flatness over the specimen -Useful for retaining inclusions and brittle phases

12-inch SILICON CARBIDE ABRASIVE PAPERS

12-inch SiC Papers with Adhesive Backing, PSA (25/pkg)



240 grit 12-inch SiC Paper with PSA (25/pkg)
Catalog no. SIC-240P12-25

PACE Product Name	Catalog Number	Qty
12-inch Combo Pack (5 each - 240, 360, 600, 800, 1200 grit SiC) (PSA)	SIC-P12C	5 each
12-inch 60 grit SiC (PSA)-25/pkg	SIC-060P12-25	25/pkg
12-inch 80 grit SiC (PSA)-25/pkg	SIC-080P12-25	25/pkg
12-inch 120 grit SiC (PSA)-25/pkg	SIC-120P12-25	25/pkg
12-inch 180 grit SiC (PSA)-25/pkg	SIC-180P12-25	25/pkg
12-inch 240 grit SiC (PSA)-25/pkg	SIC-240P12-25	25/pkg
12-inch 320 grit SiC (PSA)-25/pkg	SIC-320P12-25	25/pkg
12-inch 360 grit SiC (PSA)-25/pkg	SIC-360P12-25	25/pkg
12-inch 400 grit SiC (PSA)-25/pkg	SIC-400P12-25	25/pkg
12-inch 600 grit SiC (PSA)-25/pkg	SIC-600P12-25	25/pkg
12-inch 800 grit SiC (PSA)-25/pkg	SIC-800P12-25	25/pkg
12-inch 1000 grit SiC (PSA)-25/pkg	SIC-1000P12-25	25/pkg
12-inch 1200 grit SiC (PSA)-25/pkg	SIC-1200P12-25	25/pkg

12-inch Premium SiC Papers with Adhesive Backing, PSA (50/pkg)



600 grit 12-inch SiC Paper with PSA (50/pkg)
Catalog no. SIC-600P12-50

PACE Product Name	Catalog Number	Qty
12-inch 60 grit Premium (PSA)-50/pkg	SIC-060P12-50	50/pkg
12-inch 80 grit Premium (PSA)-50/pkg	SIC-080P12-50	50/pkg
12-inch 120 grit Premium (PSA)-50/pkg	SIC-120P12-50	50/pkg
12-inch 180 grit Premium (PSA)-50/pkg	SIC-180P12-50	50/pkg
12-inch 240 grit Premium (PSA)-50/pkg	SIC-240P12-50	50/pkg
12-inch 320 grit Premium (PSA)-50/pkg	SIC-320P12-50	50/pkg
12-inch 360 grit Premium (PSA)-50/pkg	SIC-360P12-50	50/pkg
12-inch 400 grit Premium (PSA)-50/pkg	SIC-400P12-50	50/pkg
12-inch 600 grit Premium (PSA)-50/pkg	SIC-600P12-50	50/pkg
12-inch 800 grit Premium (PSA)-50/pkg	SIC-800P12-50	50/pkg
12-inch 1000 grit Premium (PSA)-50/pkg	SIC-1000P12-50	50/pkg
12-inch 1200 grit Premium (PSA)-50/pkg	SIC-1200P12-50	50/pkg

12-inch SiC Papers with Adhesive Backing, PSA (100/pkg)

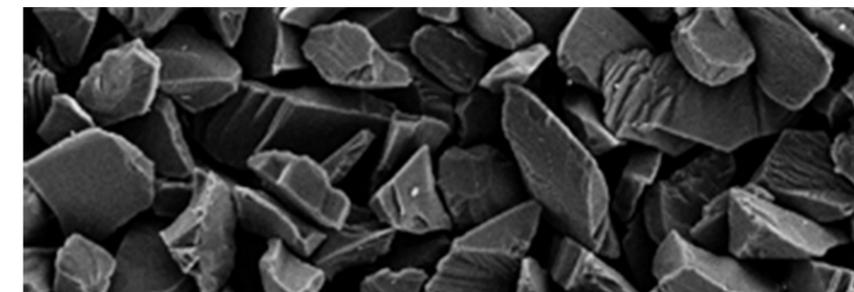


600 grit 12-inch SiC Paper with PSA (100/pkg)
Catalog no. SIC-600P12-100

PACE Product Name	Catalog Number	Qty
12-inch 60 grit SiC (PSA)-100/pkg	SIC-060P12-100	100/pkg
12-inch 80 grit SiC (PSA)-100/pkg	SIC-080P12-100	100/pkg
12-inch 120 grit SiC (PSA)-100/pkg	SIC-120P12-100	100/pkg
12-inch 180 grit SiC (PSA)-100/pkg	SIC-180P12-100	100/pkg
12-inch 240 grit SiC (PSA)-100/pkg	SIC-240P12-100	100/pkg
12-inch 320 grit SiC (PSA)-100/pkg	SIC-320P12-100	100/pkg
12-inch 360 grit SiC (PSA)-100/pkg	SIC-360P12-100	100/pkg
12-inch 400 grit SiC (PSA)-100/pkg	SIC-400P12-100	100/pkg
12-inch 600 grit SiC (PSA)-100/pkg	SIC-600P12-100	100/pkg
12-inch 800 grit SiC (PSA)-100/pkg	SIC-800P12-100	100/pkg
12-inch 1000 grit SiC (PSA)-100/pkg	SIC-1000P12-100	100/pkg
12-inch 1200 grit SiC (PSA)-100/pkg	SIC-1200P12-100	100/pkg

Abrasive Grinding Recommend Application (Fixed-Abrasive Grinding)

- Start with the finest abrasive possible (typically 240 or 320 grit abrasive paper) Note: Only use coarser grit for very heavy stock removal
- Apply lubricant to abrasive surface
- Most commonly water
- Water soluble oils for water sensitive specimens
- Rinse specimens thoroughly before proceeding to the next finer abrasive



Silicon Carbide Powder with Sharp Friable Edges

Grinding Surface Backing

Grinding papers come with different types of backing

- Plain-backed or non-adhesive backing
- PSA or pressure sensitive backing
- Foil or polyester plastic backing

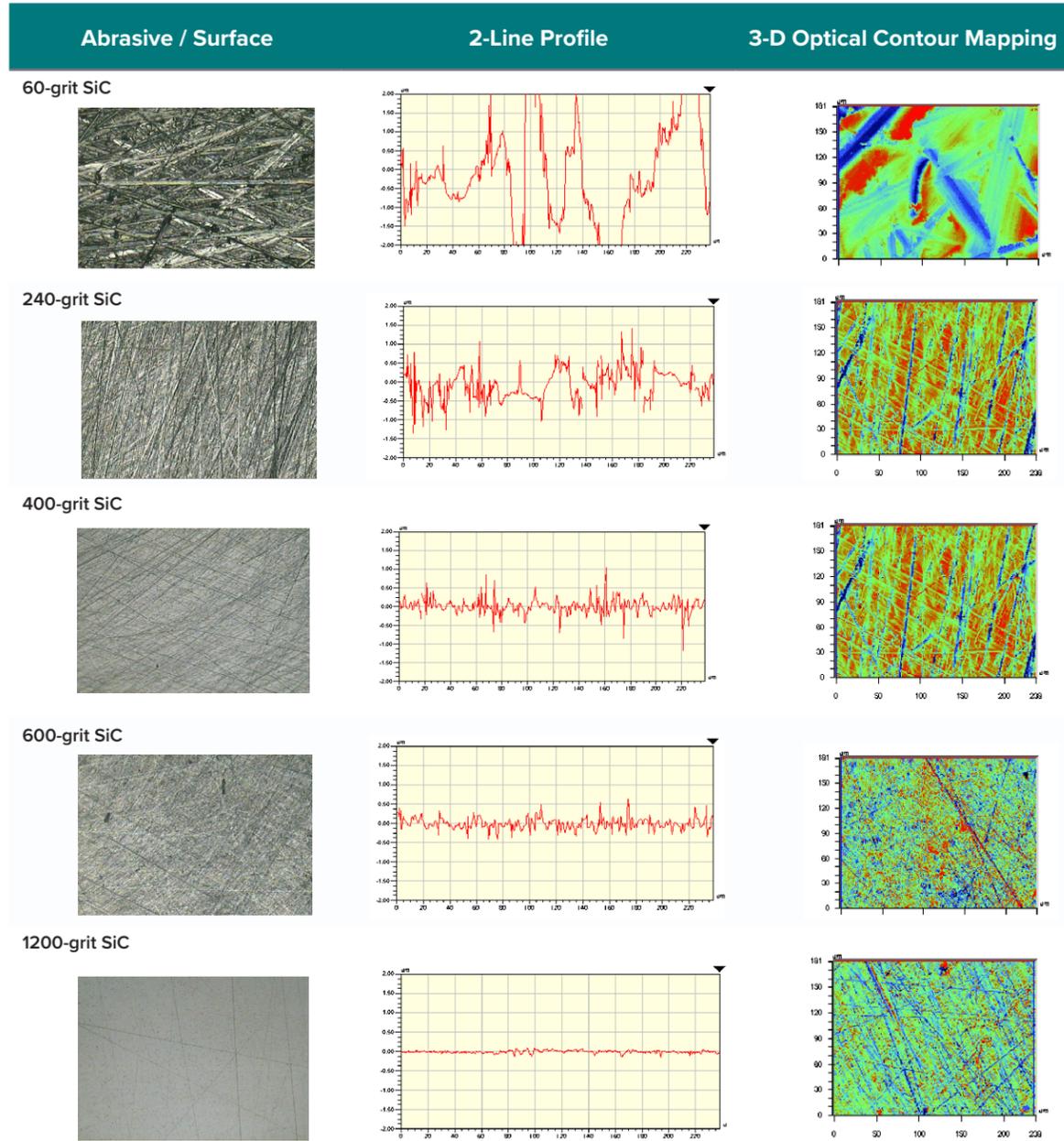
Plain-backed papers are the least expensive, however, they require either a double sided adhesive or a paper holding ring. The disadvantage to using a paper holding ring is that the mounted specimen cannot track over the edge of the grinding paper. Thus the paper does not break down uniformly and can produce over grinding of the mount. This artifact results in the polished mount exhibiting a crescent moon which can affect the edge of the specimen. This artifact has also been known as "mooning" or MRD (material removal differential).

PSA-backed or adhesive backed papers are removable grinding papers. They are more expensive than the plain-backed papers and the foil papers. They are very easy to use and avoid the problems with "mooning" and MRD if the sample tracks over both the center and edge of the grinding papers.

Foil-backed or polyester backed grinding papers are easy to use and are more economical than adhesive backed papers. The system uses a receiver adhesive disk that can be washed in order to extend its life.

Standard grit	Median Diameter (microns)	Surface Roughness on Steel, Rc 30 (Ra -nm)
60	250	-
80	180	1140
120	106	1050
180	75	880
220	63	300
320	40.5	230
400	25.8	120
600	15.3	110
800	6.5	25
1200	2.5	20

12-inch SILICON CARBIDE ABRASIVE PAPERS



12-inch Premium SiC Papers Plain-backed Non-Adhesive Backed (50/pkg)



1000 grit 12-inch SiC Plain-backed Paper (50/pkg)
Catalog no. SIC-2212-1000

PACE Product Name	Catalog Number	Qty
12-inch 60 grit Premium (Plain)-50/pkg	SIC-2212-060	50/pkg
12-inch 80 grit Premium (Plain)-50/pkg	SIC-2212-080	50/pkg
12-inch 120 grit Premium (Plain)-50/pkg	SIC-2212-120	50/pkg
12-inch 180 grit Premium (Plain)-50/pkg	SIC-2212-180	50/pkg
12-inch 240 / P220 grit Premium (Plain)-50/pkg	SIC-2212-240	50/pkg
12-inch 320 / P400 grit Premium (Plain)-50/pkg	SIC-2212-320	50/pkg
12-inch 360 / P500 grit Premium (Plain)-50/pkg	SIC-2212-360	50/pkg
12-inch 400 / P800 grit Premium (Plain)-50/pkg	SIC-2212-400	50/pkg
12-inch 600 / P1200 grit Premium (Plain)-50/pkg	SIC-2212-600	50/pkg
12-inch 800 / P2400 grit Premium (Plain)-50/pkg	SIC-2212-800	50/pkg
12-inch 1000 / P3000 grit Premium (Plain)-50/pkg	SIC-2212-1000	50/pkg
12-inch 1200 / P4000 grit Premium (Plain)-50/pkg	SIC-2212-1200	50/pkg
12-inch Double-sided adhesive -10/pkg	DSA-12	10/pkg

12-inch SiC Papers Plain-backed Non-Adhesive Backed (100/pkg)



1000 grit 12-inch SiC Plain-backed Paper (100/pkg)
Catalog no. SIC-2112-1000

PACE Product Name	Catalog Number	Qty
12-inch 60 grit SiC (Plain)-100/pkg	SIC-2112-060	100/pkg
12-inch 80 grit SiC (Plain)-100/pkg	SIC-2112-080	100/pkg
12-inch 120 grit SiC (Plain)-100/pkg	SIC-2112-120	100/pkg
12-inch 180 grit SiC (Plain)-100/pkg	SIC-2112-180	100/pkg
12-inch 240 grit SiC (Plain)-100/pkg	SIC-2112-240	100/pkg
12-inch 320 grit SiC (Plain)-100/pkg	SIC-2112-320	100/pkg
12-inch 360 grit SiC (Plain)-100/pkg	SIC-2112-360	100/pkg
12-inch 400 grit SiC (Plain)-100/pkg	SIC-2112-400	100/pkg
12-inch 600 grit SiC (Plain)-100/pkg	SIC-2112-600	100/pkg
12-inch 800 grit SiC (Plain)-100/pkg	SIC-2112-800	100/pkg
12-inch 1000 grit SiC (Plain)-100/pkg	SIC-2112-1000	100/pkg
12-inch 1200 grit SiC (Plain)-100/pkg	SIC-2112-1200	100/pkg
12-inch Double-sided adhesive -10/pkg	DSA-12	10/pkg

14-inch SILICON CARBIDE ABRASIVE PAPERS

14-inch SiC Papers with Adhesive Backing, PSA (25/pkg)



120 grit 14-inch
SiC Paper with PSA (25/pkg)
Catalog no. **SIC-120P14-25**

PACE Product Name	Catalog Number	Qty
14-inch Combo Pack (5 each - 240, 360, 600, 800, 1200 grit SiC) (PSA)	SIC-P14C	5 each
14-inch 60 grit SiC (PSA)-25/pkg	SIC-060P14-25	25/pkg
14-inch 80 grit SiC (PSA)-25/pkg	SIC-080P14-25	25/pkg
14-inch 120 grit SiC (PSA)-25/pkg	SIC-120P14-25	25/pkg
14-inch 180 grit SiC (PSA)-25/pkg	SIC-180P14-25	25/pkg
14-inch 240 grit SiC (PSA)-25/pkg	SIC-240P14-25	25/pkg
14-inch 320 grit SiC (PSA)-25/pkg	SIC-320P14-25	25/pkg
14-inch 360 grit SiC (PSA)-25/pkg	SIC-360P14-25	25/pkg
14-inch 400 grit SiC (PSA)-25/pkg	SIC-400P14-25	25/pkg
14-inch 600 grit SiC (PSA)-25/pkg	SIC-600P14-25	25/pkg
14-inch 800 grit SiC (PSA)-25/pkg	SIC-800P14-25	25/pkg
14-inch 1000 grit SiC (PSA)-25/pkg	SIC-1000P14-25	25/pkg
14-inch 1200 grit SiC (PSA)-25/pkg	SIC-1200P14-25	25/pkg

14-inch SiC Papers with Adhesive Backing, PSA (100/pkg)



600 grit 14-inch
SiC Paper with PSA (25/pkg)
Catalog no. **SIC-600P14-100**

PACE Product Name	Catalog Number	Qty
14-inch 60 grit SiC (PSA)-100/pkg	SIC-060P14-100	100/pkg
14-inch 80 grit SiC (PSA)-100/pkg	SIC-080P14-100	100/pkg
14-inch 120 grit SiC (PSA)-100/pkg	SIC-120P14-100	100/pkg
14-inch 180 grit SiC (PSA)-100/pkg	SIC-180P14-100	100/pkg
14-inch 240 grit SiC (PSA)-100/pkg	SIC-240P14-100	100/pkg
14-inch 320 grit SiC (PSA)-100/pkg	SIC-320P14-100	100/pkg
14-inch 360 grit SiC (PSA)-100/pkg	SIC-360P14-100	100/pkg
14-inch 400 grit SiC (PSA)-100/pkg	SIC-400P14-100	100/pkg
14-inch 600 grit SiC (PSA)-100/pkg	SIC-600P14-100	100/pkg
14-inch 800 grit SiC (PSA)-100/pkg	SIC-800P14-100	100/pkg
14-inch 1000 grit SiC (PSA)-100/pkg	SIC-1000P14-100	100/pkg
14-inch 1200 grit SiC (PSA)-100/pkg	SIC-1200P14-100	100/pkg

14-inch Premium SiC Papers with Adhesive Backing, PSA (50/pkg)



400 grit 14-inch
SiC Paper with PSA (100/pkg)
Catalog no. **SIC-400P14-50**

PACE Product Name	Catalog Number	Qty
14-inch 60 grit Premium (PSA)-50/pkg	SIC-060P14-50	50/pkg
14-inch 80 grit Premium (PSA)-50/pkg	SIC-080P14-50	50/pkg
14-inch 120 grit Premium (PSA)-50/pkg	SIC-120P14-50	50/pkg
14-inch 180 grit Premium (PSA)-50/pkg	SIC-180P14-50	50/pkg
14-inch 240 grit Premium (PSA)-50/pkg	SIC-240P14-50	50/pkg
14-inch 320 grit Premium (PSA)-50/pkg	SIC-320P14-50	50/pkg
14-inch 360 grit Premium (PSA)-50/pkg	SIC-360P14-50	50/pkg
14-inch 400 grit Premium (PSA)-50/pkg	SIC-400P14-50	50/pkg
14-inch 600 grit Premium (PSA)-50/pkg	SIC-600P14-50	50/pkg
14-inch 800 grit Premium (PSA)-50/pkg	SIC-800P14-50	50/pkg
14-inch 1000 grit Premium (PSA)-50/pkg	SIC-1000P14-50	50/pkg
14-inch 1200 grit Premium (PSA)-50/pkg	SIC-1200P14-50	50/pkg

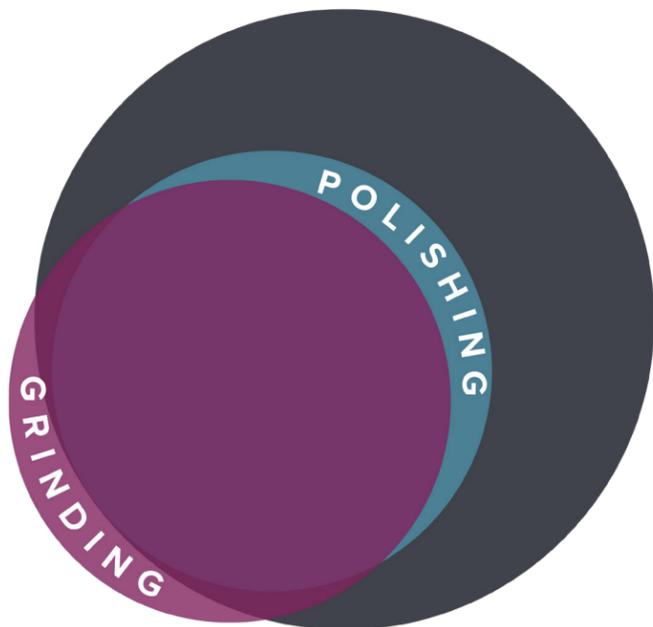


NANO-S / FEMTO-S Auto Polishers

14-inch SILICON CARBIDE ABRASIVE PAPERS

14-inch Premium SiC Papers Plain-backed Non-Adhesive Backed (50/pkg)

PACE Product Name	Catalog Number	Qty
14-inch 60 grit Premium (Plain)-50/pkg	SIC-2214-060	50/pkg
14-inch 80 grit Premium (Plain)-50/pkg	SIC-2214-080	50/pkg
14-inch 120 grit Premium (Plain)-50/pkg	SIC-2214-120	50/pkg
14-inch 180 grit Premium (Plain)-50/pkg	SIC-2214-180	50/pkg
14-inch 240 / P220 grit Premium (Plain)-50/pkg	SIC-2214-240	50/pkg
14-inch 320 / P400 grit Premium (Plain)-50/pkg	SIC-2214-320	50/pkg
14-inch 360 / P500 grit Premium (Plain)-50/pkg	SIC-2214-360	50/pkg
14-inch 400 / P800 grit Premium (Plain)-50/pkg	SIC-2214-400	50/pkg
14-inch 600 / P1200 grit Premium (Plain)-50/pkg	SIC-2211-600	50/pkg
14-inch 800 / P2400 grit Premium (Plain)-50/pkg	SIC-2214-800	50/pkg
14-inch 1000 / P3000 grit Premium (Plain)-50/pkg	SIC-2214-1000	50/pkg
14-inch 1200 / P4000 grit Premium (Plain)-50/pkg	SIC-2214-1200	50/pkg
14-inch Double-sided adhesive -10/pkg	DSA-14	10/pkg



Relative Position of the Auto Head to the Polishing Wheel

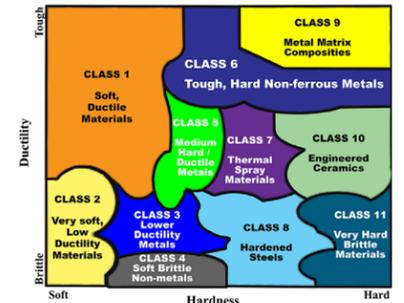
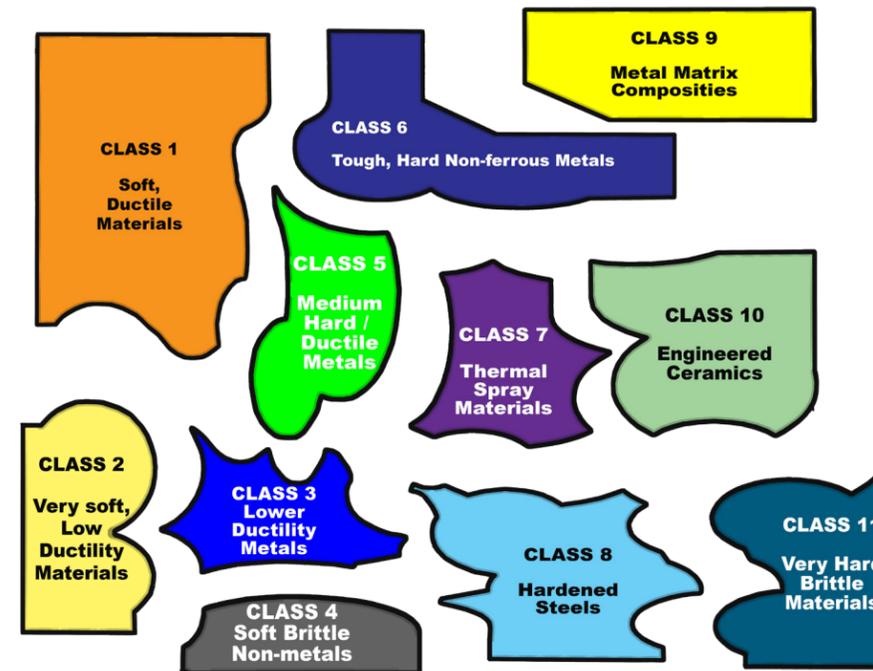
The FEMTO auto polishing head is equipped with an automatic positioning feature that ensures optimal use and uniform wear of grinding papers, while also extending the lifespan of polishing cloths.

During operation, the FEMTO head is swung over the working wheel of the NANO polishing machine. Once lowered, it automatically aligns and positions itself in the selected location. This auto-positioning capability eliminates the variability and inaccuracy associated with manually placing the polishing head.

For grinding, particularly when using SiC papers, the samples should track across both the inner and outer diameters of the paper. This ensures uniform breakdown of the abrasive surface. Failure to achieve even breakdown can cause the outer edge of the mount to grind faster, leading to Material Removal Differential (MRD).

The optimal polishing position is for the head to track along the outer edge of the working wheel, with both the head and the wheel operating at the same speed and in the same direction.

Metallographic Sample Preparation



Metallographic CLASS Procedures Chart

Metallographic sample preparation can be broken down into specific preparation Classes based on the materials hardness and ductility.

14-inch SiC Papers Plain-backed Non-Adhesive Backed (100/pkg)



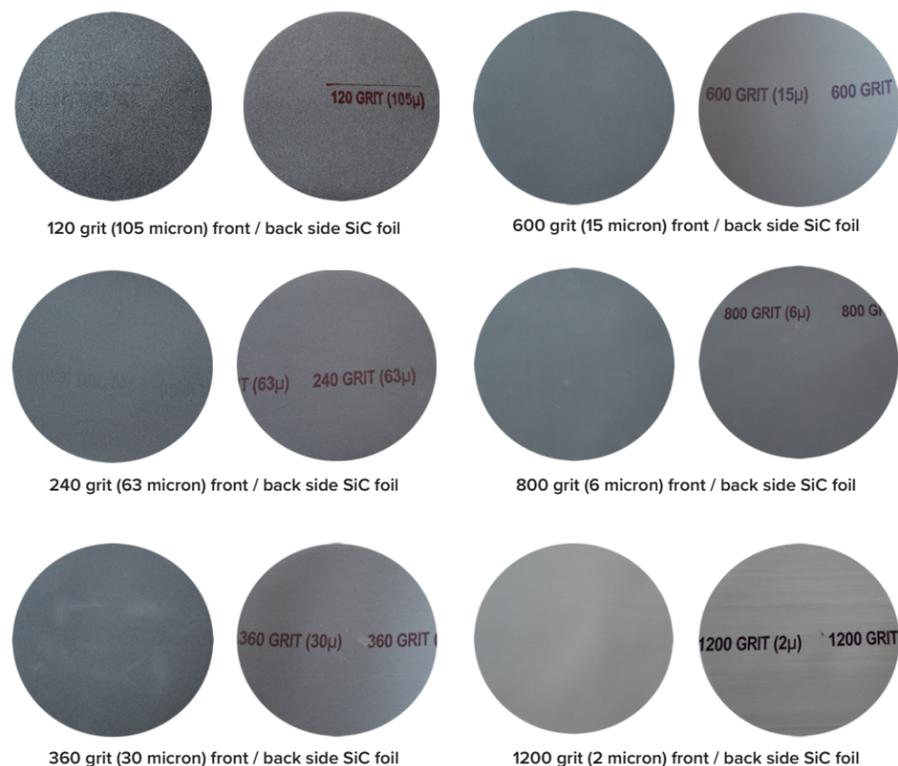
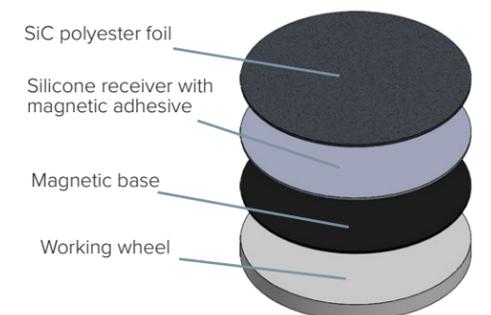
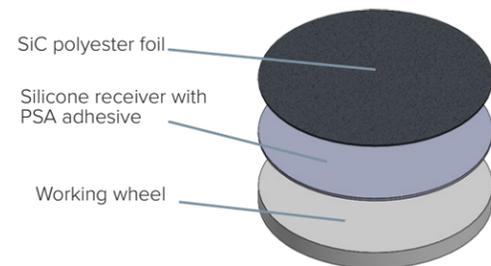
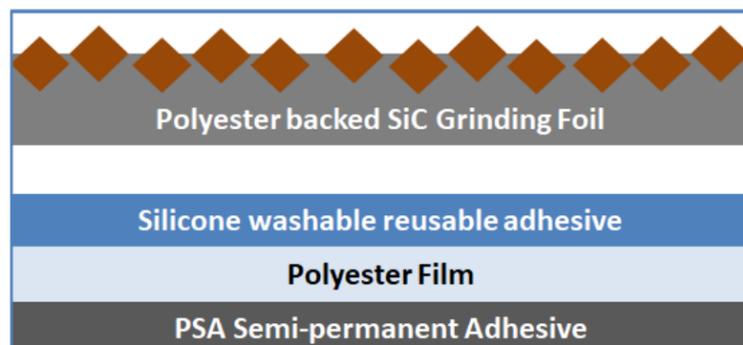
1200 grit 14-inch SiC Plain-backed Paper (100/pkg)
Catalog no. SIC-2114-1200

PACE Product Name	Catalog Number	Qty
14-inch 60 grit SIC (Plain)-100/pkg	SIC-2114-060	100/pkg
14-inch 80 grit SIC (Plain)-100/pkg	SIC-2114-080	100/pkg
14-inch 120 grit SIC (Plain)-100/pkg	SIC-2114-120	100/pkg
14-inch 180 grit SIC (Plain)-100/pkg	SIC-2114-180	100/pkg
14-inch 240 grit SIC (Plain)-100/pkg	SIC-2114-240	100/pkg
14-inch 320 grit SIC (Plain)-100/pkg	SIC-2114-320	100/pkg
14-inch 360 grit SIC (Plain)-100/pkg	SIC-2114-360	100/pkg
14-inch 400 grit SIC (Plain)-100/pkg	SIC-2114-400	100/pkg
14-inch 600 grit SIC (Plain)-100/pkg	SIC-2114-600	100/pkg
14-inch 800 grit SIC (Plain)-100/pkg	SIC-2114-800	100/pkg
14-inch 1000 grit SIC (Plain)-100/pkg	SIC-2114-1000	100/pkg
14-inch 1200 grit SIC (Plain)-100/pkg	SIC-2114-1200	100/pkg
14-inch Double-sided adhesive -10/pkg	DSA-14	10/pkg

SILICON CARBIDE FOIL SYSTEM

Grinding Foils (alternative to PSA backed papers):

As an alternative to PSA (pressure sensitive adhesive) backed silicon carbide papers, PACE Technologies offers a non PSA-backed abrasive grinding foil system. Grinding foils utilize a polyester film backing which attaches to a reusable / washable silicone adhesive receiver disk. The grinding foil system offers a lower cost alternative to PSA-backed grinding papers.



- ### SiC Foil Characteristics:
- ◆ Lower cost compared to PSA backed papers
 - ◆ Reusable / Washable Silicone backing material
 - ◆ Easy to use
 - ◆ Compatible with competitors products

Receiver Disks for SiC Foils (2/pkg)



PACE Product Name	Catalog Number	Qty
8-inch Receivers for SiC Foils (PSA-backed)	REC-5008	2/pkg
10-inch Receivers for SiC Foils (PSA-backed)	REC-5010	2/pkg
12-inch Receivers for SiC Foils (PSA-backed)	REC-5012	2/pkg
8-inch Receivers for SiC Foils (magnetic-backed)	MREC-5008	2/pkg
10-inch Receivers for SiC Foils (magnetic-backed)	MREC-5010	2/pkg
12-inch Receivers for SiC Foils (magnetic-backed)	MREC-5012	2/pkg

8-inch SiC Foils with Polyester Film Backing (50/pkg)

PACE Product Name	Catalog Number	Qty
8-inch 120 grit (105 micron) - SiC Foils (50/pkg)	SIC-5108-120	50/pkg
8-inch 240 grit (63 micron) - SiC Foils (50/pkg)	SIC-5108-240	50/pkg
8-inch 360 grit (30 micron) - SiC Foils (50/pkg)	SIC-5108-360	50/pkg
8-inch 600 grit (15 micron) - SiC Foils (50/pkg)	SIC-5108-600	50/pkg
8-inch 800 grit (6.5 micron) - SiC Foils (50/pkg)	SIC-5108-800	50/pkg
8-inch 1200 grit (2.5 micron) - SiC Foils (50/pkg)	SIC-5108-1200	50/pkg



10-inch SiC Foils with Polyester Film Backing (50/pkg)

PACE Product Name	Catalog Number	Qty
10-inch 120 grit (105 micron) - SiC Foils (50/pkg)	SIC-5110-120	50/pkg
10-inch 240 grit (63 micron) - SiC Foils (50/pkg)	SIC-5110-240	50/pkg
10-inch 360 grit (30 micron) - SiC Foils (50/pkg)	SIC-5110-360	50/pkg
10-inch 600 grit (15 micron) - SiC Foils (50/pkg)	SIC-5110-600	50/pkg
10-inch 800 grit (6.5 micron) - SiC Foils (50/pkg)	SIC-5110-800	50/pkg
10-inch 1200 grit (2.5 micron) - SiC Foils (50/pkg)	SIC-5110-1200	50/pkg



12-inch SiC Foils with Polyester Film Backing (50/pkg)

PACE Product Name	Catalog Number	Qty
12-inch 120 grit (105 micron) - SiC Foils (50/pkg)	SIC-5112-120	50/pkg
12-inch 240 grit (63 micron) - SiC Foils (50/pkg)	SIC-5112-240	50/pkg
12-inch 360 grit (30 micron) - SiC Foils (50/pkg)	SIC-5112-360	50/pkg
12-inch 600 grit (15 micron) - SiC Foils (50/pkg)	SIC-5112-600	50/pkg
12-inch 800 grit (6.5 micron) - SiC Foils (50/pkg)	SIC-5112-800	50/pkg
12-inch 1200 grit (2.5 micron) - SiC Foils (50/pkg)	SIC-5112-1200	50/pkg



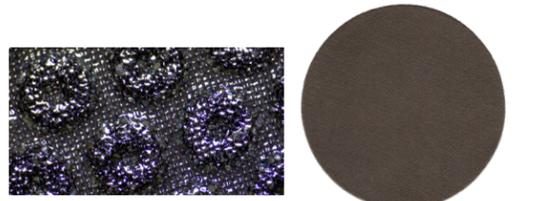
DIAMOND GRINDING

Diamond Grinding Disks:

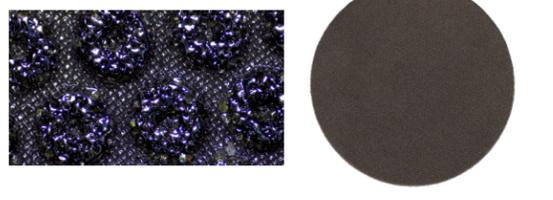
Diamond grinding is most commonly used for grinding very hard brittle materials such as engineered ceramics. In practice, diamond grinding disks are also used to planar grind a wide range of other metals and minerals.

Diamond Bonding:

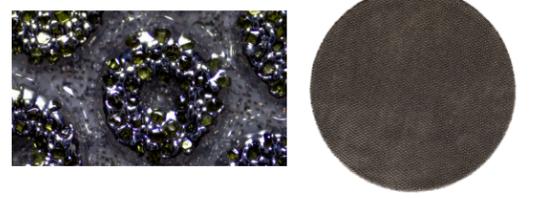
There are two types of bonding for diamond grinding disks: metal and resin. Metal bonded diamond grinding disks are more aggressive and can produce more damage. Resin bonded disks will break down easier to produce a better surface finish, however, they typically have lower life.



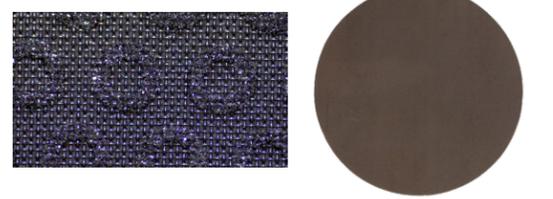
250 micron Metal Bonded Diamond Disk (20X close-up on left)



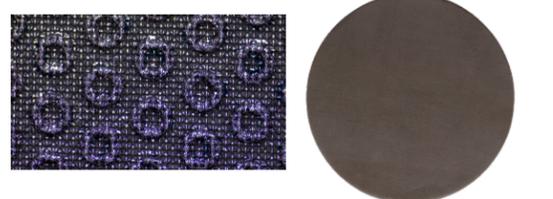
125 micron Metal Bonded Diamond Disk (20X close-up on left)



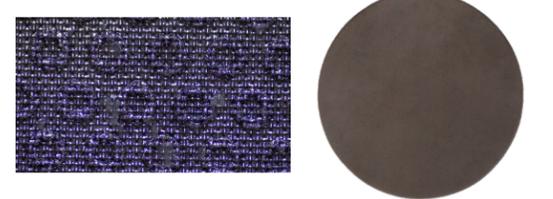
75 micron Metal Bonded Diamond Disk (20X close-up on left)



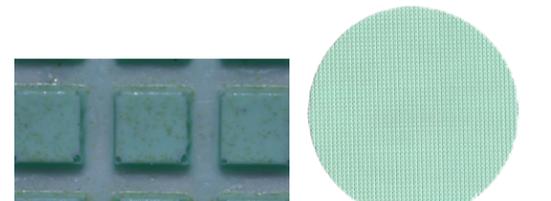
40 micron Metal Bonded Diamond Disk (20X close-up on left)



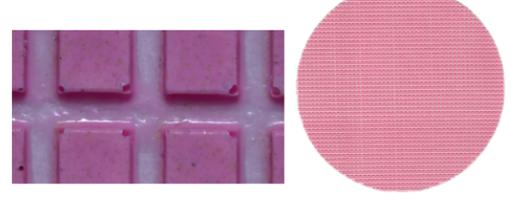
30 micron Metal Bonded Diamond Disk (20X close-up on left)



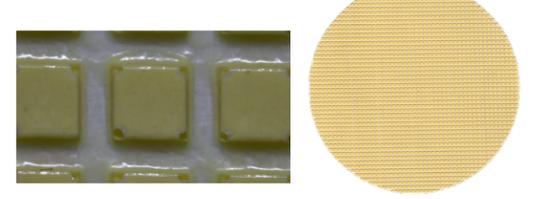
15 micron Metal Bonded Diamond Disk (20X close-up on left)



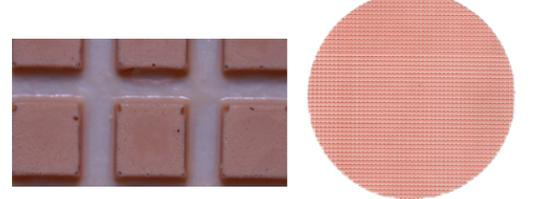
125 micron Resin Bonded Diamond Disk (10X close-up on left)



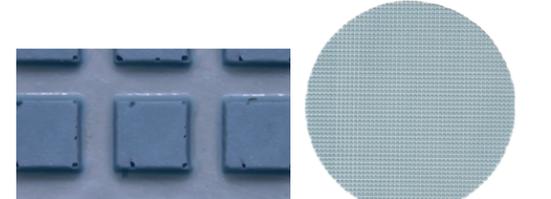
70 micron Resin Bonded Diamond Disk (10X close-up on left)



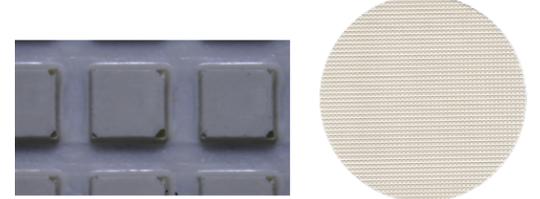
35 micron Resin Bonded Diamond Disk (10X close-up on left)



25 micron Resin Bonded Diamond Disk (10X close-up on left)



15 micron Resin Bonded Diamond Disk (10X close-up on left)



9 micron Resin Bonded Diamond Disk (10X close-up on left)

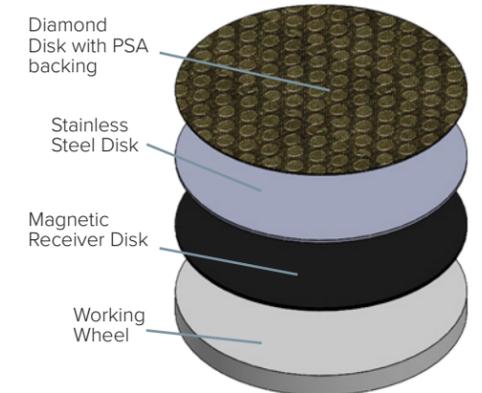
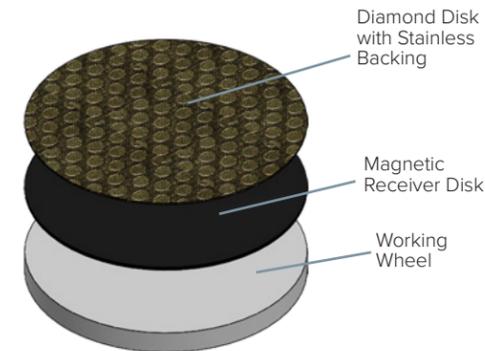
MAGNETIC BACKED DISKS

Diamond MD Grinding Disks:

As an alternative to PSA (pressure sensitive adhesives) diamond grinding disks, PACE Technologies offers magnetic backed (MD) abrasive diamond grinding disks. The magnetic diamond disks can be purchased pre-assembled on a magnetic stainless steel plate or the stainless steel plate can be purchased separately and the user can assemble the adhesive backed diamond grinding disks onto a magnetic stainless steel plate.

MD Grinding Disks:

- ◆ Easy to change disks
- ◆ More convenient for storage
- ◆ Do not need to dedicate a working wheel for each abrasive size



Magnetic Base Disks and Plates

PACE Product Name	Catalog No. (in)	Catalog No. (mm)	Qty
8-in / 200 mm MAGNETON Base Disk (PSA)	MAG-B08	MAG-B200	each
10-in / 250 mm MAGNETON Base Disk (PSA)	MAG-B10	MAG-B250	each
12-inch / 300 mm MAGNETON Base Disk (PSA)	MAG-B12	MAG-B300	each
14-inch MAGNETON Base Disk (PSA)	MAG-B14	n.a.	each



MAGNETON Base Disk



MAGNEPAD Stainless Steel Magnetic Plate

PACE Product Name	Catalog No. (inch)	Catalog No. (mm)	Qty
8-in / 200 mm MAGNEPAD Stainless Steel Magnetic Base Plate	SSMAG-P08	SSMAG-P200	each
10-in / 250 mm MAGNEPAD Stainless Steel Magnetic Base Plate	SSMAG-P10	SSMAG-P250	each
12-inch / 300 mm MAGNEPAD Stainless Steel Magnetic Base Plate	SSMAG-P12	SSMAG-P300	each
14-inch MAGNEPAD Stainless Steel Magnetic Base Plate	SSMAG-P14	n.a.	each

PACE Product Name	Catalog Number	Qty
8-inch MAGNEPAD Teflon Coated Magnetic Base Plate	MAG-P08	each
10-inch MAGNEPAD Teflon Coated Magnetic Base Plate	MAG-P10	each
12-inch MAGNEPAD Teflon Coated Magnetic Base Plate	MAG-P12	each
14-inch MAGNEPAD Teflon Coated Magnetic Base Plate	MAG-P14	each



MAGNEPAD Teflon Coated Magnetic Plate

DIAMOND GRINDING ABRASIVES (8-inch)

8-inch Metal Bonded Diamond Grinding Disk with PSA Adhesive

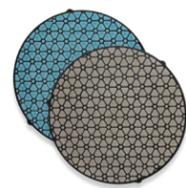
PACE Product Name	Catalog Number	Qty
8-inch 250 micron metal bonded Diamond Abrasive Grinding Disk with PSA backing	DIA-M250-08-PSA	each
8-inch 125 micron metal bonded Diamond Abrasive Grinding Disk with PSA backing	DIA-M125-08-PSA	each
8-inch 75 micron metal bonded Diamond Abrasive Grinding Disk with PSA backing	DIA-M075-08-PSA	each
8-inch 40 micron metal bonded Diamond Abrasive Grinding Disk with PSA backing	DIA-M040-08-PSA	each
8-inch 30 micron metal bonded Diamond Abrasive Grinding Disk with PSA backing	DIA-M030-08-PSA	each
8-inch 15 micron metal bonded Diamond Abrasive Grinding Disk with PSA backing	DIA-M015-08-PSA	each

8-inch Diamond Resin Bonded Grinding Disk with PSA Adhesive

PACE Product Name	Catalog Number	Qty
8-inch 125 micron resin bonded Diamond Abrasive Grinding Disk with PSA backing	DIA-R125-08-PSA	each
8-inch 70 micron resin bonded Diamond Abrasive Grinding Disk with PSA backing	DIA-R070-08-PSA	each
8-inch 35 micron resin bonded Diamond Abrasive Grinding Disk with PSA backing	DIA-R035-08-PSA	each
8-inch 25 micron resin bonded Diamond Abrasive Grinding Disk with PSA backing	DIA-R025-08-PSA	each
8-inch 15 micron resin bonded Diamond Abrasive Grinding Disk with PSA backing	DIA-R015-08-PSA	each
8-inch 9 micron resin bonded Diamond Abrasive Grinding Disk with PSA backing	DIA-R009-08-PSA	each

8-inch Composite Grinding Disks

PACE Product Name	Catalog Number	Qty
8-inch MD ORION Composite Disk for 3-6 micron diamond suspensions	ORION-MD08	each
8-inch MD SIRIUS Composite Disk for 6-15 micron diamond suspensions	SIRIUS-MD08	each



8-inch ORION and SIRIUS Composite Disks

8-inch Magnetic Plates

PACE Product Name	Catalog Number	Qty
8-inch MAGNETON Base Disk (PSA)	MAG-B08	each
8-inch MAGNEPAD Stainless Steel Magnetic Base Plate	SSMAG-P08	each
8-inch MAGNEPAD Teflon Coated Magnetic Base Plate	MAG-P08	each



8-inch MAGNEPAD Teflon Base Plate

8-inch Metal Bonded Diamond Grinding Disk with Magnetic Backing

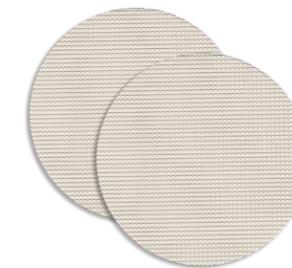


15 micron MAG Metal Bonded Diamond Disk

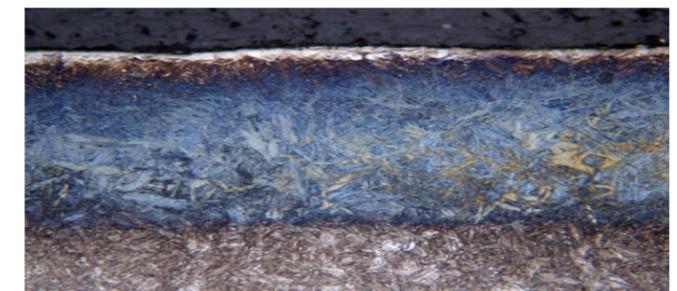
PACE Product Name	Catalog Number	Qty
8-inch 250 micron metal bonded Diamond Abrasive Grinding Disk with Magnetic backing	DIA-M250-08-MAG	each
8-inch 125 micron metal bonded Diamond Abrasive Grinding Disk with magnetic backing	DIA-M125-08-MAG	each
8-inch 75 micron metal bonded Diamond Abrasive Grinding Disk with magnetic backing	DIA-M075-08-MAG	each
8-inch 40 micron metal bonded Diamond Abrasive Grinding Disk with magnetic backing (each)	DIA-M040-08-MAG	each
8-inch 30 micron metal bonded Diamond Abrasive Grinding Disk with magnetic backing	DIA-M030-08-MAG	each
8-inch 15 micron metal bonded Diamond Abrasive Grinding Disk with magnetic backing	DIA-M015-08-MAG	each

8-inch Diamond Resin Bonded Grinding Disk with Magnetic Backing

PACE Product Name	Catalog Number	Qty
8-inch 125 micron resin bonded Diamond Abrasive Grinding Disk with magnetic backing	DIA-R125-08-MAG	each
8-inch 70 micron resin bonded Diamond Abrasive Grinding Disk with magnetic backing	DIA-R070-08-MAG	each
8-inch 35 micron resin bonded Diamond Abrasive Grinding Disk with magnetic backing	DIA-R035-08-MAG	each
8-inch 25 micron resin bonded Diamond Abrasive Grinding Disk with magnetic backing	DIA-R025-08-MAG	each
8-inch 15 micron resin bonded Diamond Abrasive Grinding Disk with magnetic backing	DIA-R015-08-MAG	each
8-inch 9 micron resin bonded Diamond Abrasive Grinding Disk with magnetic backing	DIA-R009-08-MAG	each



9 micron MAG Resin Bonded Diamond Disk



Nitrided Steel with White Layer, Mag. 200X

DIAMOND GRINDING ABRASIVES (10-inch)

10-inch Metal Bonded Diamond Grinding Disk with PSA Adhesive

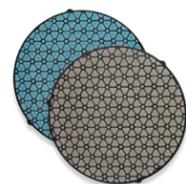
PACE Product Name	Catalog Number	Qty
10-inch 250 micron metal bonded Diamond Abrasive Grinding Disk with PSA backing	DIA-M250-10-PSA	each
10-inch 125 micron metal bonded Diamond Abrasive Grinding Disk with PSA backing	DIA-M125-10-PSA	each
10-inch 75 micron metal bonded Diamond Abrasive Grinding Disk with PSA backing	DIA-M075-10-PSA	each
10-inch 40 micron metal bonded Diamond Abrasive Grinding Disk with PSA backing	DIA-M040-10-PSA	each
10-inch 30 micron metal bonded Diamond Abrasive Grinding Disk with PSA backing	DIA-M030-10-PSA	each
10-inch 15 micron metal bonded Diamond Abrasive Grinding Disk with PSA backing	DIA-M015-10-PSA	each

10-inch Diamond Resin Bonded Grinding Disk with PSA Adhesive

PACE Product Name	Catalog Number	Qty
10-inch 125 micron resin bonded Diamond Abrasive Grinding Disk with PSA backing	DIA-R125-10-PSA	each
10-inch 70 micron resin bonded Diamond Abrasive Grinding Disk with PSA backing	DIA-R070-10-PSA	each
10-inch 35 micron resin bonded Diamond Abrasive Grinding Disk with PSA backing	DIA-R035-10-PSA	each
10-inch 25 micron resin bonded Diamond Abrasive Grinding Disk with PSA backing	DIA-R025-10-PSA	each
10-inch 15 micron resin bonded Diamond Abrasive Grinding Disk with PSA backing	DIA-R015-10-PSA	each
10-inch 9 micron resin bonded Diamond Abrasive Grinding Disk with PSA backing	DIA-R009-10-PSA	each

10-inch Composite Grinding Disks

PACE Product Name	Catalog Number	Qty
10-inch MD ORION Composite Disk for 3-6 micron diamond suspensions	ORION-MD10	each
10-inch MD SIRIUS Composite Disk for 6-15 micron diamond suspensions	SIRIUS-MD10	each



10-inch ORION and SIRIUS Composite Disks

10-inch Magnetic Plates

PACE Product Name	Catalog Number	Qty
10-inch MAGNETON Base Disk (PSA)	MAG-B10	each
10-inch MAGNEPAD Stainless Steel Magnetic Base Plate	SSMAG-P10	each
10-inch MAGNEPAD Teflon Coated Magnetic Base Plate	MAG-P10	each



10-inch MAGNEPAD Stainless Steel Base Plate

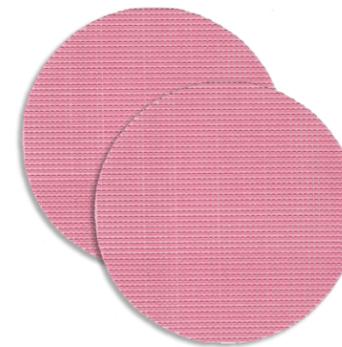
10-inch Metal Bonded Diamond Grinding Disk with Magnetic Backing



30 micron MAG Metal Bonded Diamond Disk

PACE Product Name	Catalog Number	Qty
10-inch 250 micron metal bonded Diamond Abrasive Grinding Disk with magnetic backing	DIA-M250-10-MAG	each
10-inch 125 micron metal bonded Diamond Abrasive Grinding Disk with magnetic backing	DIA-M125-10-MAG	each
10-inch 75 micron metal bonded Diamond Abrasive Grinding Disk with magnetic backing	DIA-M075-10-MAG	each
10-inch 40 micron metal bonded Diamond Abrasive Grinding Disk with magnetic backing	DIA-M040-10-MAG	each
10-inch 30 micron metal bonded Diamond Abrasive Grinding Disk with magnetic backing	DIA-M030-10-MAG	each
10-inch 15 micron metal bonded Diamond Abrasive Grinding Disk with magnetic backing	DIA-M015-10-MAG	each

10-inch Diamond Resin Bonded Grinding Disk with Magnetic Backing



70 micron PSA Resin Bonded Diamond Disk

PACE Product Name	Catalog Number	Qty
10-inch 125 micron resin bonded Diamond Abrasive Grinding Disk with magnetic backing	DIA-R125-10-MAG	each
10-inch 70 micron resin bonded Diamond Abrasive Grinding Disk with magnetic backing	DIA-R070-10-MAG	each
10-inch 35 micron resin bonded Diamond Abrasive Grinding Disk with magnetic backing	DIA-R035-10-MAG	each
10-inch 25 micron resin bonded Diamond Abrasive Grinding Disk with magnetic backing	DIA-R025-10-MAG	each
10-inch 15 micron resin bonded Diamond Abrasive Grinding Disk with magnetic backing	DIA-R015-10-MAG	each
10-inch 9 micron resin bonded Diamond Abrasive Grinding Disk with magnetic backing	DIA-R009-10-MAG	each



Steel - Titanium Weld, Mag. 1000X

DIAMOND GRINDING ABRASIVES (12-inch)

12-inch Metal Bonded Diamond Grinding Disk with PSA Adhesive

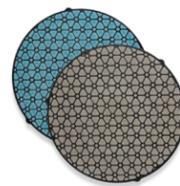
PACE Product Name	Catalog Number	Qty
12-inch 250 micron metal bonded Diamond Abrasive Grinding Disk with PSA backing	DIA-M250-12-PSA	each
12-inch 125 micron metal bonded Diamond Abrasive Grinding Disk with PSA backing	DIA-M125-12-PSA	each
12-inch 75 micron metal bonded Diamond Abrasive Grinding Disk with PSA backing	DIA-M075-12-PSA	each
12-inch 40 micron metal bonded Diamond Abrasive Grinding Disk with PSA backing	DIA-M040-12-PSA	each
12-inch 30 micron metal bonded Diamond Abrasive Grinding Disk with PSA backing	DIA-M030-12-PSA	each
12-inch 15 micron metal bonded Diamond Abrasive Grinding Disk with PSA backing	DIA-M015-12-PSA	each

12-inch Diamond Resin Bonded Grinding Disk with PSA Adhesive

PACE Product Name	Catalog Number	Qty
12-inch 125 micron resin bonded Diamond Abrasive Grinding Disk with PSA backing	DIA-R125-12-PSA	each
12-inch 70 micron resin bonded Diamond Abrasive Grinding Disk with PSA backing	DIA-R070-12-PSA	each
12-inch 35 micron resin bonded Diamond Abrasive Grinding Disk with PSA backing	DIA-R035-12-PSA	each
12-inch 25 micron resin bonded Diamond Abrasive Grinding Disk with PSA backing	DIA-R025-12-PSA	each
12-inch 15 micron resin bonded Diamond Abrasive Grinding Disk with PSA backing	DIA-R015-12-PSA	each
12-inch 9 micron resin bonded Diamond Abrasive Grinding Disk with PSA backing	DIA-R009-12-PSA	each

12-inch Composite Grinding Disks

PACE Product Name	Catalog Number	Qty
12-inch MD ORION Composite Disk for 3-6 micron diamond suspensions	ORION-MD12	each
12-inch MD SIRIUS Composite Disk for 6-15 micron diamond suspensions	SIRIUS-MD12	each



12-inch ORION and SIRIUS Composite Disks

12-inch Magnetic Plates

PACE Product Name	Catalog Number	Qty
12-inch MAGNETON Base Disk (PSA)	MAG-B12	each
12-inch MAGNEPAD Stainless Steel Magnetic Base Plate	SSMAG-P12	each
12-inch MAGNEPAD Teflon Coated Magnetic Base Plate	MAG-P12	each



12-inch MAGNEPAD Teflon Base Plate

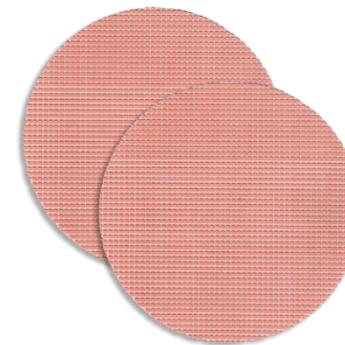
12-inch Metal Bonded Diamond Grinding Disk with Magnetic Backing



40 micron MAG Metal Bonded Diamond Disk

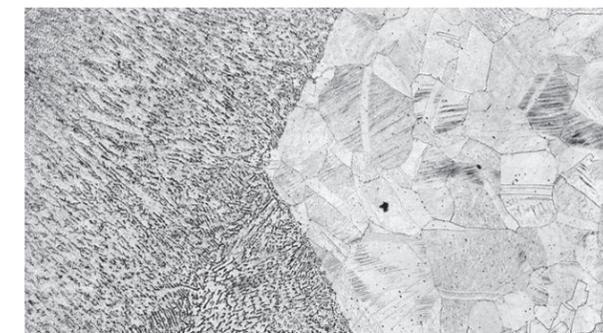
PACE Product Name	Catalog Number	Qty
12-inch 250 micron metal bonded Diamond Abrasive Grinding Disk with magnetic backing	DIA-M250-12-MAG	each
12-inch 125 micron metal bonded Diamond Abrasive Grinding Disk with magnetic backing	DIA-M125-12-MAG	each
12-inch 75 micron metal bonded Diamond Abrasive Grinding Disk with magnetic backing	DIA-M075-12-MAG	each
12-inch 40 micron metal bonded Diamond Abrasive Grinding Disk with magnetic backing	DIA-M040-12-MAG	each
12-inch 30 micron metal bonded Diamond Abrasive Grinding Disk with magnetic backing	DIA-M030-12-MAG	each
12-inch 15 micron metal bonded Diamond Abrasive Grinding Disk with magnetic backing	DIA-M015-12-MAG	each

12-inch Diamond Resin Bonded Grinding Disk with Magnetic Backing



25 micron MAG Resin Bonded Diamond Disk

PACE Product Name	Catalog Number	Qty
12-inch 125 micron resin bonded Diamond Abrasive Grinding Disk with magnetic backing	DIA-R125-12-MAG	each
12-inch 70 micron resin bonded Diamond Abrasive Grinding Disk with magnetic backing	DIA-R070-12-MAG	each
12-inch 35 micron resin bonded Diamond Abrasive Grinding Disk with magnetic backing	DIA-R035-12-MAG	each
12-inch 25 micron resin bonded Diamond Abrasive Grinding Disk with magnetic backing	DIA-R025-12-MAG	each
12-inch 15 micron resin bonded Diamond Abrasive Grinding Disk with magnetic backing	DIA-R015-12-MAG	each
12-inch 9 micron resin bonded Diamond Abrasive Grinding Disk with magnetic backing	DIA-R009-12-MAG	each



Perfect Weld Joint, 50X

PREMIUM DIAMOND GRINDING DISKS

8-inch Premium Metal Bonded Diamond Grinding Disk with PSA Adhesive

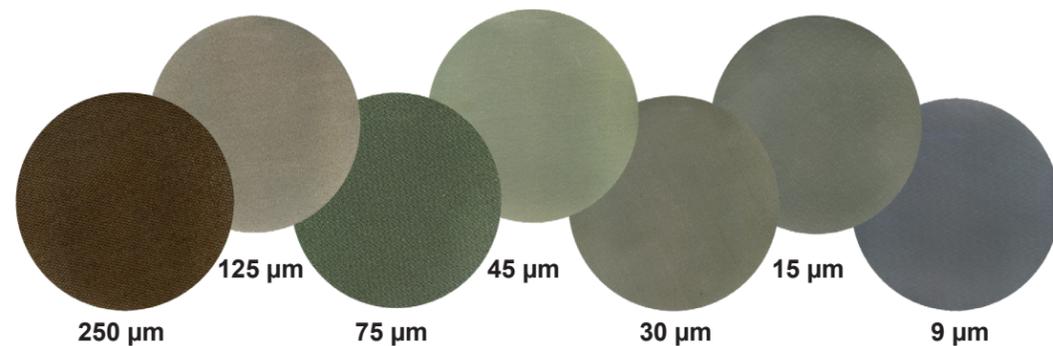
PACE Product Name	Catalog Number	Qty
8-inch 250 micron Premium Diamond Abrasive Grinding Disk with PSA adhesive	DIA-DISK-8250	each
8-inch 125 micron Premium Diamond Abrasive Grinding Disk with PSA adhesive	DIA-DISK-8125	each
8-inch 75 micron Premium Diamond Abrasive Grinding Disk with PSA adhesive	DIA-DISK-8075	each
8-inch 45 micron Premium Diamond Abrasive Grinding Disk with PSA adhesive	DIA-DISK-8045	each
8-inch 30 micron Premium Diamond Abrasive Grinding Disk with PSA adhesive	DIA-DISK-8030	each
8-inch 15 micron Premium Diamond Abrasive Grinding Disk with PSA adhesive	DIA-DISK-8015	each
8-inch 9 micron Premium Diamond Abrasive Grinding Disk with PSA adhesive	DIA-DISK-8009	each

10-inch Premium Metal Bonded Diamond Grinding Disk with PSA Adhesive

PACE Product Name	Catalog Number	Qty
10-inch 250 micron Premium Diamond Abrasive Grinding Disk with PSA adhesive	DIA-DISK-10250	each
10-inch 125 micron Premium Diamond Abrasive Grinding Disk with PSA adhesive	DIA-DISK-10125	each
10-inch 75 micron Premium Diamond Abrasive Grinding Disk with PSA adhesive	DIA-DISK-10075	each
10-inch 45 micron Premium Diamond Abrasive Grinding Disk with PSA adhesive	DIA-DISK-10045	each
10-inch 30 micron Premium Diamond Abrasive Grinding Disk with PSA adhesive	DIA-DISK-10030	each
10-inch 15 micron Premium Diamond Abrasive Grinding Disk with PSA adhesive	DIA-DISK-10015	each
10-inch 9 micron Premium Diamond Abrasive Grinding Disk with PSA adhesive	DIA-DISK-10009	each

12-inch Premium Metal Bonded Diamond Grinding Disk with PSA Adhesive

PACE Product Name	Catalog Number	Qty
12-inch 250 micron Premium Diamond Abrasive Grinding Disk with PSA adhesive	DIA-DISK-12250	each
12-inch 125 micron Premium Diamond Abrasive Grinding Disk with PSA adhesive	DIA-DISK-12125	each
12-inch 75 micron Premium Diamond Abrasive Grinding Disk with PSA adhesive	DIA-DISK-12075	each
12-inch 45 micron Premium Diamond Abrasive Grinding Disk with PSA adhesive	DIA-DISK-12045	each
12-inch 30 micron Premium Diamond Abrasive Grinding Disk with PSA adhesive	DIA-DISK-12030	each
12-inch 15 micron Premium Diamond Abrasive Grinding Disk with PSA adhesive	DIA-DISK-12015	each
12-inch 9 micron Premium Diamond Abrasive Grinding Disk with PSA adhesive	DIA-DISK-12009	each



Magnetic Plates

Magnetic Plates	8-inch	10-inch	12-inch	14-inch
PACE Product Name	Cat. No.	Cat. No.	Cat. No.	Cat. No.
MAGNETON Base Disk (PSA)	MAG-B08	MAG-B10	MAG-B12	MAG-B14
MAGNEPAD Stainless Steel Magnetic Base	SSMAG-P08	SSMAG-P10	SSMAG-P12	SSMAG-P14
MAGNEPAD Teflon Coated Magnetic Base	MAG-P08	MAG-P10	MAG-P12	MAG-P14

8-inch Premium Metal Bonded Diamond Grinding Disk with Magnetic Backing

PACE Product Name	Catalog Number	Qty
8-inch 250 micron Premium Diamond Abrasive Grinding Disk with magnetic backing	PDGD8-250M	each
8-inch 125 micron Premium Diamond Abrasive Grinding Disk with magnetic backing	PDGD8-125M	each
8-inch 75 micron Premium Diamond Abrasive Grinding Disk with magnetic backing	PDGD8-75M	each
8-inch 45 micron Premium Diamond Abrasive Grinding Disk with magnetic backing	PDGD8-45M	each
8-inch 30 micron Premium Diamond Abrasive Grinding Disk with magnetic backing	PDGD8-30M	each
8-inch 15 micron Premium Diamond Abrasive Grinding Disk with magnetic backing	PDGD8-15M	each
8-inch 9 micron Premium Diamond Abrasive Grinding Disk with magnetic backing	PDGD8-09M	each

10-inch Premium Metal Bonded Diamond Grinding Disk with Magnetic Backing

PACE Product Name	Catalog Number	Qty
10-inch 250 micron Premium Diamond Abrasive Grinding Disk with magnetic backing	PDGD10-250M	each
10-inch 125 micron Premium Diamond Abrasive Grinding Disk with magnetic backing	PDGD10-125M	each
10-inch 75 micron Premium Diamond Abrasive Grinding Disk with magnetic backing	PDGD10-75M	each
10-inch 45 micron Premium Diamond Abrasive Grinding Disk with magnetic backing	PDGD10-45M	each
10-inch 30 micron Premium Diamond Abrasive Grinding Disk with magnetic backing	PDGD10-30M	each
10-inch 15 micron Premium Diamond Abrasive Grinding Disk with magnetic backing	PDGD10-15M	each
10-inch 9 micron Premium Diamond Abrasive Grinding Disk with magnetic backing	PDGD10-09M	each

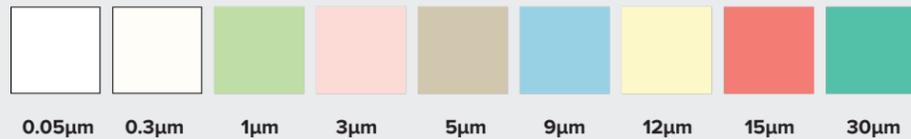
12-inch Premium Metal Bonded Diamond Grinding Disk with Magnetic Backing

PACE Product Name	Catalog Number	Qty
12-inch 250 micron Premium Diamond Abrasive Grinding Disk with magnetic backing	PDGD12-250M	each
12-inch 125 micron Premium Diamond Abrasive Grinding Disk with magnetic backing	PDGD12-125M	each
12-inch 75 micron Premium Diamond Abrasive Grinding Disk with magnetic backing	PDGD12-75M	each
12-inch 45 micron Premium Diamond Abrasive Grinding Disk with magnetic backing	PDGD12-45M	each
12-inch 30 micron Premium Diamond Abrasive Grinding Disk with magnetic backing	PDGD12-30M	each
12-inch 15 micron Premium Diamond Abrasive Grinding Disk with magnetic backing	PDGD12-15M	each
12-inch 9 micron Premium Diamond Abrasive Grinding Disk with magnetic backing	PDGD12-09M	each

Lapping Films (Superior Flatness):

The primary advantage of coated abrasives on lapping films is improved flatness across the specimen surface. This is especially true for specimens that have a large variation in the hardness for the specimen constituents. The abrasive is coated onto a polyester film versus a paper backing. The result is a harder base surface. Typically abrasive lapping films include, alumina and diamond. Diamond lapping films are quite common for grinding and polishing of electronic components, including silicon dies. Alumina is very useful for softer materials, such as aluminum, tin, lead, zinc; refractory materials such as rhenium, tungsten and niobium; as well as specimens having solder joints or soft coatings.

Micron Size Color Guide for Alumina Lapping Films



Lapping Film Characteristics:

- ◆ Produces flatter or more planar surfaces for materials having large variations in hardness
- ◆ Alternative to paper backed abrasive products

8-inch Alumina Lapping Films with Plain-Backing

PACE Product Name	Catalog Number	Qty
0.05 micron alumina plain-backed lapping film (8-inch)	ALO-8105PB	100/pkg
0.3 micron alumina plain-backed lapping film (8-inch)	ALO-8103PB	100/pkg
1 micron alumina plain-backed lapping film (8-inch)	ALO-8001PB	100/pkg
3 micron alumina plain-backed lapping film (8-inch)	ALO-8003PB	100/pkg
5 micron alumina plain-backed lapping film (8-inch)	ALO-8005PB	100/pkg
9 micron alumina plain-backed lapping film (8-inch)	ALO-8009PB	100/pkg
12 micron alumina plain-backed lapping film (8-inch)	ALO-8012PB	100/pkg
15 micron alumina plain-backed lapping film (8-inch)	ALO-8015PB	100/pkg
30 micron alumina plain-backed lapping film (8-inch)	ALO-8030PB	100/pkg



8-inch Alumina Lapping Films with PSA Adhesive-Backing

PACE Product Name	Catalog Number	Qty
0.05 micron alumina PSA adhesive-backed lapping film (8-inch)	ALO-8105PSA	100/pkg
0.3 micron alumina PSA adhesive-backed lapping film (8-inch)	ALO-8103PSA	100/pkg
1 micron alumina PSA adhesive-backed lapping film (8-inch)	ALO-8001PSA	100/pkg
3 micron alumina PSA adhesive-backed lapping film (8-inch)	ALO-8003PSA	100/pkg
5 micron alumina PSA adhesive-backed lapping film (8-inch)	ALO-8005PSA	100/pkg
9 micron alumina PSA adhesive-backed lapping film (8-inch)	ALO-8009PSA	100/pkg
12 micron alumina PSA adhesive-backed lapping film (8-inch)	ALO-8012PSA	100/pkg
15 micron alumina PSA adhesive-backed lapping film (8-inch)	ALO-8015PSA	100/pkg
30 micron alumina PSA adhesive-backed lapping film (8-inch)	ALO-8030PSA	100/pkg



8-inch Diamond Lapping Films with Plain-backing

PACE Product Name	Catalog Number	Qty
0.10 micron diamond plain-backed lapping film (8-inch)	DA-01P8	5/pkg
0.25 micron diamond plain-backed lapping film (8-inch)	DA-025P8	5/pkg
0.50 micron diamond plain-backed lapping film (8-inch)	DA-05P8	5/pkg
1 micron diamond plain-backed lapping film (8-inch)	DA-1P8	5/pkg
3 micron diamond plain-backed lapping film (8-inch)	DA-3P8	5/pkg
6 micron diamond plain-backed lapping film (8-inch)	DA-6P8	5/pkg
9 micron diamond plain-backed lapping film (8-inch)	DA-9P8	5/pkg
15 micron diamond plain-backed lapping film (8-inch)	DA-15P8	5/pkg
30 micron diamond plain-backed lapping film (8-inch)	DA-30P8	5/pkg
45 micron diamond plain-backed lapping film (8-inch)	DA-45P8	5/pkg



8-inch Diamond Lapping Films with Adhesive (PSA) Backing

PACE Product Name	Catalog Number	Qty
0.10 micron diamond PSA adhesive-backed lapping film (8-inch)	DAA-01P8	5/pkg
0.25 micron diamond PSA adhesive-backed lapping film (8-inch)	DAA-025P8	5/pkg
0.50 micron diamond PSA adhesive-backed lapping film (8-inch)	DAA-05P8	5/pkg
1 micron diamond PSA adhesive-backed lapping film (8-inch)	DAA-1P8	5/pkg
3 micron diamond PSA adhesive-backed lapping film (8-inch)	DAA-3P8	5/pkg
6 micron diamond PSA adhesive-backed lapping film (8-inch)	DAA-6P8	5/pkg
9 micron diamond PSA adhesive-backed lapping film (8-inch)	DAA-9P8	5/pkg
15 micron diamond PSA adhesive-backed lapping film (8-inch)	DAA-15P8	5/pkg
30 micron diamond PSA adhesive-backed lapping film (8-inch)	DAA-30P8	5/pkg
45 micron diamond PSA adhesive-backed lapping film (8-inch)	DAA-45P8	5/pkg



Micron Size Color Guide for Diamond Lapping Films



ABRASIVE LAPPING FILMS (10-inch)

10-inch Alumina Lapping Films with Plain-Backing

PACE Product Name	Catalog Number	Qty
0.05 micron alumina plain-backed lapping film (10-inch)	ALO-10105PB	100/pkg
0.3 micron alumina plain-backed lapping film (10-inch)	ALO-10103PB	100/pkg
1 micron alumina plain-backed lapping film (10-inch)	ALO-1001PB	100/pkg
3 micron alumina plain-backed lapping film (10-inch)	ALO-1003PB	100/pkg
5 micron alumina plain-backed lapping film (10-inch)	ALO-1005PB	100/pkg
9 micron alumina plain-backed lapping film (10-inch)	ALO-1009PB	100/pkg
12 micron alumina plain-backed lapping film (10-inch)	ALO-1012PB	100/pkg
15 micron alumina plain-backed lapping film (10-inch)	ALO-1015PB	100/pkg
30 micron alumina plain-backed lapping film (10-inch)	ALO-1030PB	100/pkg



3 μ m Alumina PB Lapping Film

10-inch Alumina Lapping Films with PSA Adhesive-Backing

PACE Product Name	Catalog Number	Qty
0.05 micron alumina PSA adhesive-backed lapping film (10-inch)	ALO-10105PSA	100/pkg
0.3 micron alumina PSA adhesive-backed lapping film (10-inch)	ALO-10103PSA	100/pkg
1 micron alumina PSA adhesive-backed lapping film (10-inch)	ALO-1001PSA	100/pkg
3 micron alumina PSA adhesive-backed lapping film (10-inch)	ALO-1003PSA	100/pkg
5 micron alumina PSA adhesive-backed lapping film (10-inch)	ALO-1005PSA	100/pkg
9 micron alumina PSA adhesive-backed lapping film (10-inch)	ALO-1009PSA	100/pkg
12 micron alumina PSA adhesive-backed lapping film (10-inch)	ALO-1012PSA	100/pkg
15 micron alumina PSA adhesive-backed lapping film (10-inch)	ALO-1015PSA	100/pkg
30 micron alumina PSA adhesive-backed lapping film (10-inch)	ALO-1030PSA	100/pkg



9 μ m Alumina PSA Lapping Film

Micron Size Color Guide for Alumina Lapping Films



Micron Size Color Guide for Diamond Lapping Films



10-inch Diamond Lapping Films with Plain-backing

PACE Product Name	Catalog Number	Qty
0.10 micron diamond plain-backed lapping film (10-inch)	DA-01P10	5/pkg
0.25 micron diamond plain-backed lapping film (10-inch)	DA-025P10	5/pkg
0.50 micron diamond plain-backed lapping film (10-inch)	DA-05P10	5/pkg
1 micron diamond plain-backed lapping film (10-inch)	DA-1P10	5/pkg
3 micron diamond plain-backed lapping film (10-inch)	DA-3P10	5/pkg
6 micron diamond plain-backed lapping film (10-inch)	DA-6P10	5/pkg
9 micron diamond plain-backed lapping film (10-inch)	DA-9P10	5/pkg
15 micron diamond plain-backed lapping film (10-inch)	DA-15P10	5/pkg
30 micron diamond plain-backed lapping film (10-inch)	DA-30P10	5/pkg
45 micron diamond plain-backed lapping film (10-inch)	DA-45P10	5/pkg



0.5 μ m Diamond PB Lapping Film

10-inch Diamond Lapping Films with Adhesive (PSA) Backing

PACE Product Name	Catalog Number	Qty
0.10 micron diamond PSA adhesive-backed lapping film (10-inch)	DAA-01P10	5/pkg
0.25 micron diamond PSA adhesive-backed lapping film (10-inch)	DAA-025P10	5/pkg
0.50 micron diamond PSA adhesive-backed lapping film (10-inch)	DAA-05P10	5/pkg
1 micron diamond PSA adhesive-backed lapping film (10-inch)	DAA-1P10	5/pkg
3 micron diamond PSA adhesive-backed lapping film (10-inch)	DAA-3P10	5/pkg
6 micron diamond PSA adhesive-backed lapping film (10-inch)	DAA-6P10	5/pkg
9 micron diamond PSA adhesive-backed lapping film (10-inch)	DAA-9P10	5/pkg
15 micron diamond PSA adhesive-backed lapping film (10-inch)	DAA-15P10	5/pkg
30 micron diamond PSA adhesive-backed lapping film (10-inch)	DAA-30P10	5/pkg
45 micron diamond PSA adhesive-backed lapping film (10-inch)	DAA-45P10	5/pkg



1 μ m Diamond PSA Lapping Film

ABRASIVE LAPPING FILMS (12-inch)

12-inch Alumina Lapping Films with Plain-Backing

PACE Product Name	Catalog Number	Qty
0.05 micron alumina plain-backed lapping film (12-inch)	ALO-12105PB	100/pkg
0.3 micron alumina plain-backed lapping film (12-inch)	ALO-12103PB	100/pkg
1 micron alumina plain-backed lapping film (12-inch)	ALO-1201PB	100/pkg
3 micron alumina plain-backed lapping film (12-inch)	ALO-1203PB	100/pkg
5 micron alumina plain-backed lapping film (12-inch)	ALO-1205PB	100/pkg
9 micron alumina plain-backed lapping film (12-inch)	ALO-1209PB	100/pkg
12 micron alumina plain-backed lapping film (12-inch)	ALO-1212PB	100/pkg
15 micron alumina plain-backed lapping film (12-inch)	ALO-1215PB	100/pkg
30 micron alumina plain-backed lapping film (12-inch)	ALO-1230PB	100/pkg



12 μm Alumina PB Lapping Film

12-inch Alumina Lapping Films with PSA Adhesive-Backing

PACE Product Name	Catalog Number	Qty
0.05 micron alumina PSA adhesive-backed lapping film (12-inch)	ALO-12105PSA	100/pkg
0.3 micron alumina PSA adhesive-backed lapping film (12-inch)	ALO-12103PSA	100/pkg
1 micron alumina PSA adhesive-backed lapping film (12-inch)	ALO-1201PSA	100/pkg
3 micron alumina PSA adhesive-backed lapping film (12-inch)	ALO-1203PSA	100/pkg
5 micron alumina PSA adhesive-backed lapping film (12-inch)	ALO-1205PSA	100/pkg
9 micron alumina PSA adhesive-backed lapping film (12-inch)	ALO-1209PSA	100/pkg
12 micron alumina PSA adhesive-backed lapping film (12-inch)	ALO-1212PSA	100/pkg
15 micron alumina PSA adhesive-backed lapping film (12-inch)	ALO-1215PSA	100/pkg
30 micron alumina PSA adhesive-backed lapping film (12-inch)	ALO-1230PSA	100/pkg



15 μm Alumina PSA Lapping Film

Micron Size Color Guide for Alumina Lapping Films



Micron Size Color Guide for Diamond Lapping Films



12-inch Diamond Lapping Films with Plain-backing

PACE Product Name	Catalog Number	Qty
0.10 micron diamond lapping film, (plain-backed) (12-inch)	DA-01P12	3/pkg
0.25 micron diamond lapping film, (plain-backed) (12-inch)	DA-025P12	3/pkg
0.50 micron diamond lapping film, (plain-backed) (12-inch)	DA-05P12	3/pkg
1 micron diamond lapping film, (plain-backed) (12-inch)	DA-1P12	3/pkg
3 micron diamond lapping film, (plain-backed) (12-inch)	DA-3P12	3/pkg
6 micron diamond lapping film, (plain-backed) (12-inch)	DA-6P12	3/pkg
9 micron diamond lapping film, (plain-backed) (12-inch)	DA-9P12	3/pkg
15 micron diamond lapping film, (plain-backed) (12-inch)	DA-15P12	3/pkg
30 micron diamond lapping film, (plain-backed) (12-inch)	DA-30P12	3/pkg
45 micron diamond lapping film, (plain-backed) (12-inch)	DA-45P12	3/pkg



3 μm Diamond PB Lapping Film

12-inch Diamond Lapping Films with Adhesive (PSA) Backing

PACE Product Name	Catalog Number	Qty
0.10 micron diamond PSA adhesive-backed lapping film (12-inch)	DAA-01P12	3/pkg
0.25 micron diamond PSA adhesive-backed lapping film (12-inch)	DAA-025P12	3/pkg
0.50 micron diamond PSA adhesive-backed lapping film (12-inch)	DAA-05P12	3/pkg
1 micron diamond PSA adhesive-backed lapping film (12-inch)	DAA-1P12	3/pkg
3 micron diamond PSA adhesive-backed lapping film (12-inch)	DAA-3P12	3/pkg
6 micron diamond PSA adhesive-backed lapping film (12-inch)	DAA-6P12	3/pkg
9 micron diamond PSA adhesive-backed lapping film (12-inch)	DAA-9P12	3/pkg
15 micron diamond PSA adhesive-backed lapping film (12-inch)	DAA-15P12	3/pkg
30 micron diamond PSA adhesive-backed lapping film (12-inch)	DAA-30P12	3/pkg
45 micron diamond PSA adhesive-backed lapping film (12-inch)	DAA-45P12	3/pkg



6 μm Diamond PSA Lapping Film

Achieve precise, consistent, and high quality surface finishes with our Premium Diamond Lapping Films.

Key Features & Benefits

- ◆ Provides consistent abrasive coverage for reliable and repeatable results across the entire film surface.
- ◆ Precision-graded diamond particles ensure fast material removal while preserving surface integrity.
- ◆ Ideal for applications requiring minimal debris and tightly controlled surface texture.
- ◆ Available in plain-backed and PSA-backed.
- ◆ Standard sizes include 8, 10, and 12-inch disks to fit most metallographic equipment.
- ◆ Custom diameters can be provided to meet unique preparation needs. Contact us for more details.
- ◆ Suitable for a wide range of materials including metals, ceramics, composites, and electronic components.



Micron Size Color Guide for Premium Diamond Lapping Films



Take your sample preparation to the next level by pairing our Diamond Lapping Films with the precision of the ATTO-1000S Micro-Polisher. This powerful combination is designed to deliver the surface quality and consistency needed for advanced material analysis.

Why Use Diamond Lapping Films with the ATTO-1000S?

The ATTO-1000S delivers micron-level accuracy and real-time material removal monitoring. Our diamond lapping films are designed to match that precision, ensuring consistent, controlled material removal across hard materials like ceramics, carbides, hardened metals, and more.

Excellent Surface Quality

Achieve scratch-free, damage free finishes ready for high-resolution microscopy. The films help fully utilize ATTO's programmable polishing parameters and dual micrometers for optimized flatness and surface quality.

Enhanced Workflow Efficiency

With ATTO's support for both 8 and 10-inch discs, and our films available in 8, 10, and 12-inch sizes, users can seamlessly integrate them for a perfect fit and minimal downtime during preparation.

Backings for Any Setup

Offered in both plain-backed and PSA-backed options, these films accommodate various mounting preferences on the ATTO-1000S platform.

Repeatable Results for Critical Analysis

Designed to work with ATTO's programmable grinding and polishing cycles, premium diamond lapping films contribute to highly reproducible and reliable outcomes, critical for comparative or failure analysis.



8-inch Premium Diamond Lapping Films with Plain-Backing



1 µm Premium Diamond PB Lapping Film

PACE Product Name	Catalog Number	Qty
0.10 micron premium diamond plain-backed lapping film (8-inch)	PDA-01P8	5/pkg
0.25 micron premium diamond plain-backed lapping film (8-inch)	PDA-025P8	5/pkg
0.50 micron premium diamond plain-backed lapping film (8-inch)	PDA-05P8	5/pkg
1 micron premium diamond plain-backed lapping film (8-inch)	PDA-1P8	5/pkg
3 micron premium diamond plain-backed lapping film (8-inch)	PDA-3P8	5/pkg
6 micron premium diamond plain-backed lapping film (8-inch)	PDA-6P8	5/pkg
9 micron premium diamond plain-backed lapping film (8-inch)	PDA-9P8	5/pkg
15 micron premium diamond plain-backed lapping film (8-inch)	PDA-15P8	5/pkg
30 micron premium diamond plain-backed lapping film (8-inch)	PDA-30P8	5/pkg
45 micron premium diamond plain-backed lapping film (8-inch)	PDA-45P8	5/pkg

8-inch Premium Diamond Lapping Films with PSA Backing



3 µm Premium Diamond PSA Lapping Film

PACE Product Name	Catalog Number	Qty
0.10 micron premium diamond PSA adhesive-backed lapping film (8-inch)	PDAA-01P8	5/pkg
0.25 micron premium diamond PSA adhesive-backed lapping film (8-inch)	PDAA-025P8	5/pkg
0.50 micron premium diamond PSA adhesive-backed lapping film (8-inch)	PDAA-05P8	5/pkg
1 micron premium diamond PSA adhesive-backed lapping film (8-inch)	PDAA-1P8	5/pkg
3 micron premium diamond PSA adhesive-backed lapping film (8-inch)	PDAA-3P8	5/pkg
6 micron premium diamond PSA adhesive-backed lapping film (8-inch)	PDAA-6P8	5/pkg
9 micron premium diamond PSA adhesive-backed lapping film (8-inch)	PDAA-9P8	5/pkg
15 micron premium diamond PSA adhesive-backed lapping film (8-inch)	PDAA-15P8	5/pkg
30 micron premium diamond PSA adhesive-backed film (8-inch)	PDAA-30P8	5/pkg
45 micron premium diamond PSA adhesive-backed film (8-inch)	PDAA-45P8	5/pkg

PREMIUM DIAMOND LAPPING FILM (10-inch)

PREMIUM DIAMOND LAPPING FILM (12-inch)

10-inch Premium Diamond Lapping Films with Plain-Backing

PACE Product Name	Catalog Number	Qty
0.10 micron premium diamond plain-backed lapping film (10-inch)	PDA-01P10	5/pkg
0.25 micron premium diamond plain-backed lapping film (10-inch)	PDA-025P10	5/pkg
0.50 micron premium diamond plain-backed lapping film (10-inch)	PDA-05P10	5/pkg
1 micron premium diamond plain-backed lapping film (10-inch)	PDA-1P10	5/pkg
3 micron premium diamond plain-backed lapping film (10-inch)	PDA-3P10	5/pkg
6 micron premium diamond plain-backed lapping film (10-inch)	PDA-6P10	5/pkg
9 micron premium diamond plain-backed lapping film (10-inch)	PDA-9P10	5/pkg
15 micron premium diamond plain-backed lapping film (10-inch)	PDA-15P10	5/pkg
30 micron premium diamond plain-backed lapping film (10-inch)	PDA-30P10	5/pkg
45 micron premium diamond plain-backed lapping film (10-inch)	PDA-45P10	5/pkg



6 µm Premium Diamond PB Lapping Film

12-inch Premium Diamond Lapping Films with Plain-Backing

PACE Product Name	Catalog Number	Qty
0.10 micron premium diamond plain-backed lapping film (12-inch)	PDA-01P12	3/pkg
0.25 micron premium diamond plain-backed lapping film (12-inch)	PDA-025P12	3/pkg
0.50 micron premium diamond plain-backed lapping film (12-inch)	PDA-05P12	3/pkg
1 micron premium diamond plain-backed lapping film (12-inch)	PDA-1P12	3/pkg
3 micron premium diamond plain-backed lapping film (12-inch)	PDA-3P12	3/pkg
6 micron premium diamond plain-backed lapping film (12-inch)	PDA-6P12	3/pkg
9 micron premium diamond plain-backed lapping film (12-inch)	PDA-9P12	3/pkg
15 micron premium diamond plain-backed lapping film (12-inch)	PDA-15P12	3/pkg
30 micron premium diamond plain-backed lapping film (12-inch)	PDA-30P12	3/pkg
45 micron premium diamond plain-backed lapping film (12-inch)	PDA-45P12	3/pkg



15 µm Premium Diamond PB Lapping Film

10-inch Premium Diamond Lapping Films with PSA Backing

PACE Product Name	Catalog Number	Qty
0.10 micron premium diamond PSA adhesive-backed lapping film (10-inch)	PDAA-01P10	5/pkg
0.25 micron premium diamond PSA adhesive-backed lapping film (10-inch)	PDAA-025P10	5/pkg
0.50 micron premium diamond PSA adhesive-backed lapping film (10-inch)	PDAA-05P10	5/pkg
1 micron premium diamond PSA adhesive-backed lapping film (10-inch)	PDAA-1P10	5/pkg
3 micron premium diamond PSA adhesive-backed lapping film (10-inch)	PDAA-3P10	5/pkg
6 micron premium diamond PSA adhesive-backed lapping film (10-inch)	PDAA-6P10	5/pkg
9 micron premium diamond PSA adhesive-backed lapping film (10-inch)	PDAA-9P10	5/pkg
15 micron premium diamond PSA adhesive-backed lapping film (10-inch)	PDAA-15P10	5/pkg
30 micron premium diamond PSA adhesive-backed lapping film (10-inch)	PDAA-30P10	5/pkg
45 micron premium diamond PSA adhesive-backed lapping film (10-inch)	PDAA-45P10	5/pkg



9 µm Premium Diamond PSA Lapping Film

12-inch Premium Diamond Lapping Films with PSA Backing

PACE Product Name	Catalog Number	Qty
0.10 micron premium diamond PSA adhesive-backed lapping film (12-inch)	PDAA-01P12	3/pkg
0.25 micron premium diamond PSA adhesive-backed lapping film (12-inch)	PDAA-025P12	3/pkg
0.50 micron premium diamond PSA adhesive-backed lapping film (12-inch)	PDAA-05P12	3/pkg
1 micron premium diamond PSA adhesive-backed lapping film (12-inch)	PDAA-1P12	3/pkg
3 micron premium diamond PSA adhesive-backed lapping film (12-inch)	PDAA-3P12	3/pkg
6 micron premium diamond PSA adhesive-backed lapping film (12-inch)	PDAA-6P12	3/pkg
9 micron premium diamond PSA adhesive-backed lapping film (12-inch)	PDAA-9P12	3/pkg
15 micron premium diamond PSA adhesive-backed lapping film (12-inch)	PDAA-15P12	3/pkg
30 micron premium diamond PSA adhesive-backed film (12-inch)	PDAA-30P12	3/pkg
45 micron premium diamond PSA adhesive-backed film (12-inch)	PDAA-45P12	3/pkg

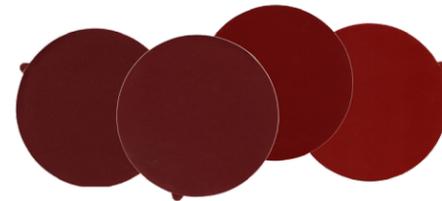


30 µm Premium Diamond PSA Lapping Film

ABRASIVE GRINDING SURFACES

Alumina Grinding Abrasives (Reduced Embedded Abrasives):

Alumina abrasives are typically used for grinding specimens that have a tendency to embed abrasive particles such as friable silicon carbide. Materials susceptible to embedding abrasive particles include low recrystallizing temperature metals such as tin, zinc and lead; electronic components containing solder joints; soft copper and aluminum metals; as well as, refractory metals such as rhenium, niobium and tungsten. Alumina abrasives are the better choice because they are more durable and do not fracture as easily.



Alumina Grinding Papers

8-inch Alumina Grinding Papers with Plain-Backing

PACE Product Name	Catalog Number	Qty
P120 grit ALO plain-backed grinding paper (8-inch)-100/pkg	ALO-2108-P120	100/pkg
P220 grit ALO plain-backed grinding paper (8-inch)-100/pkg	ALO-2108-P220	100/pkg
P500 grit ALO plain-backed grinding paper (8-inch)-100/pkg	ALO-2108-P500	100/pkg
P1200 grit ALO plain-backed grinding paper (8-inch)-100/pkg	ALO-2108-P1200	100/pkg

10-inch Alumina Grinding Papers with Plain-Backing

PACE Product Name	Catalog Number	Qty
P120 grit ALO plain-backed grinding paper (10-inch)-100/pkg	ALO-2110-P120	100/pkg
P220 grit ALO plain-backed grinding paper (10-inch)-100/pkg	ALO-2110-P220	100/pkg
P500 grit ALO plain-backed grinding paper (10-inch)-100/pkg	ALO-2110-P500	100/pkg
P1200 grit ALO plain-backed grinding paper (10-inch)-100/pkg	ALO-2110-P1200	100/pkg



Alumina plain-backed Paper

12-inch Alumina Grinding Papers with Plain-Backing

PACE Product Name	Catalog Number	Qty
P120 grit ALO plain-backed grinding paper (12-inch)-100/pkg	ALO-2112-P120	100/pkg
P220 grit ALO plain-backed grinding paper (12-inch)-100/pkg	ALO-2112-P220	100/pkg
P500 grit ALO plain-backed grinding paper (12-inch)-100/pkg	ALO-2112-P500	100/pkg
P1200 grit ALO plain-backed grinding paper (12-inch)-100/pkg	ALO-2112-P1200	100/pkg

Zirconia Grinding Abrasives

Zirconia is an extremely durable and hard abrasive, making it an excellent choice for belt grinders and for planar grinding steps on rotary grinder/polishers. It offers a longer lifespan compared to other abrasives. However, its primary drawback is the need for higher grinding forces when compared to silicon carbide (SiC) and alumina abrasives. Additionally, zirconia is only available in coarser grit sizes, which may limit its suitability for certain applications.

8-inch Alumina Grinding Papers with PSA Adhesive-Backing

PACE Product Name	Catalog Number	Qty
P120 grit ALO PSA adhesive-backed grinding paper (8-inch)-100/pkg	ALO-120P8-100	100/pkg
P220 grit ALO PSA adhesive-backed grinding paper (8-inch)-100/pkg	ALO-220P8-100	100/pkg
P500 grit ALO PSA adhesive-backed grinding paper (8-inch)-100/pkg	ALO-500P8-100	100/pkg
P1200 grit ALO PSA adhesive-backed grinding paper (8-inch)-100/pkg	ALO-1200P8-100	100/pkg

10-inch Alumina Grinding Papers with PSA Adhesive-Backing



Alumina PSA-backed Paper

PACE Product Name	Catalog Number	Qty
P120 grit ALO PSA adhesive-backed grinding paper (10-inch)-100/pkg	ALO-120P10-100	100/pkg
P220 grit ALO PSA adhesive-backed grinding paper (10-inch)-100/pkg	ALO-220P10-100	100/pkg
P500 grit ALO PSA adhesive-backed grinding paper (10-inch)-100/pkg	ALO-500P10-100	100/pkg
P1200 grit ALO PSA adhesive-backed grinding paper (10-inch)-100/pkg	ALO-1200P10-100	100/pkg

12-inch Alumina Grinding Papers with PSA Adhesive-Backing

PACE Product Name	Catalog Number	Qty
P120 grit ALO PSA adhesive-backed grinding paper (12-inch)-100/pkg	ALO-120P12-100	100/pkg
P220 grit ALO PSA adhesive-backed grinding paper (12-inch)-100/pkg	ALO-220P12-100	100/pkg
P500 grit ALO PSA adhesive-backed grinding paper (12-inch)-100/pkg	ALO-500P12-100	100/pkg
P1200 grit ALO PSA adhesive-backed grinding paper (12-inch)-100/pkg	ALO-1200P12-100	100/pkg

Zirconia Grinding Papers with PSA Adhesive-Backing



Zirconia Grinding Papers

PACE Product Name	Catalog Number	Qty
120 grit Zirconia PSA adhesive-backed grinding paper (8-inch)-25/pkg	ZR-120P08-25	25/pkg
220 grit Zirconia PSA adhesive-backed grinding paper (8-inch)-25/pkg	ZR-220P08-25	25/pkg
120 grit Zirconia PSA adhesive-backed grinding paper (10-inch)-25/pkg	ZR-120P10-25	25/pkg
220 grit Zirconia PSA adhesive-backed grinding paper (10-inch)-25/pkg	ZR-220P10-25	25/pkg
120 grit Zirconia PSA adhesive-backed grinding paper (12-inch)-25/pkg	ZR-120P12-25	25/pkg
220 grit Zirconia PSA adhesive-backed grinding paper (12-inch)-25/pkg	ZR-220P12-25	25/pkg

Metallographic Polishing

Metallographic polishing can be broken into two polishing categories: rough polishing and final polishing. Proper polishing requires the correct combination of polishing pad and abrasive, as well as, utilizing proper polishing machine conditions (speed, direction and force).

Minimizing Polishing Artifacts

To minimize polishing artifacts such as edge rounding, phase relief, smeared metal, grain pull-out and inclusion pull-out, the polishing time should be kept to a minimum. This can be accomplished by:

- ◆ minimizing sectioning damage
- ◆ grinding with the finest feasible abrasives
- ◆ using flat polishing base plates

Minimizing sectioning damage and using the correct grinding abrasives are fairly obvious. However, using a flat supporting plate is generally overlooked by most suppliers of metallographic equipment, and if they do consider plate flatness they generally do not go far enough. As a guideline, an 8-inch plate should have no more than a 0.0001 inch (2.5 micron) run out, which represents a 0.6 micron run out over a 1-inch diameter specimen. Recognize that final polishing abrasives have a typical size of 0.05-0.06 micron, thus these tolerances are required to minimize polishing times. In addition, if the specimen is not flat on the polishing plate then a differential pressure occurs across the specimen, which causes polishing relief. Likewise for a 12-inch diameter plate the run out should not exceed 0.0002 inches (5 micron). As a result both polishing times and differential polishing pressures can be minimized.

Suggestion: If your polishing plate is not flat within these tolerances they should be lapped to these tighter tolerances.

SEM Image	Polishing Pad Description	Abrasive Application	Product Image
	CERMESH Metal Mesh cloth - this is a wire mesh material useful for coarse and intermediate lapping/polishing. The texture of this wire allows for the abrasive to become semi-fixed; thus offering the advantage of increased stock removal, while minimizing damage	45, 30 or 15 micron diamond suspensions	
	POLYPAD Polishing Pad - this cloth is a synthetic polyester polishing pad which has a similar action to a nylon pad, with the exception that it is much more durable. It is used in the intermediate polishing steps	15, 9 or 6 micron diamond suspensions	
	TEXPAN Polishing Pad - this is the most commonly used polishing cloth material for the intermediate diamond polishing steps. TEXPAN Polishing pad is a non-woven polishing pad	9 or 6 micron diamond and 3 or 1 micron diamond with colloidal silica	
	Black CHEM 2 Polishing Pad this is a porometric polymer pad which has a consistency similar to a rubber type of pad. Black CHEM 2 pad has a low nap but behaves as an intermediate polishing pad with a performance between low napped and high napped pads	Colloidal silica or diamond and colloidal silica mixtures	

SEM Image	Polishing Pad Description	Abrasive Application	Product Image
	GOLDPAD Polishing Pad is a woven polishing pad for intermediate polishing primarily with 1-9 micron diamond	9 or 6 micron diamond and 3 or 1 micron diamond with colloidal silica	
	NYPAD Polishing Pad - this is a woven silk polishing pad for intermediate polishing primarily with intermediate diamond abrasives	9 or 6 micron diamond and 3 or 1 micron diamond with colloidal silica	
	DACRON II Polishing Cloth - this is a woven polishing pad for polishing primarily with 1-15 micron diamond abrasives. The DACRON II pad is the most popular intermediate polishing pad in Europe and is used mostly for polishing metals. Its higher nap provides a very soft and gentle polishing action	3 or 1 micron diamond or alumina	
	ATLANTIS Polishing Pad - is a woven low polishing pad with a foam backing for better matting to the specimen sample. It is an excellent polishing pad for 1-6 micron diamond	3 or 1 micron diamond or alumina	
	MICROPAD Polishing Cloth - this is the most common high napped final polishing pad for most metals and polymers. Its high nap provides it a very soft and gentle polishing action	1 micron or finer final polishing diamond or alumina	
	TRICOTE Polishing Pad - a tight high napped final polishing pad for most metals. It has a tighter nap than the MICROPAD Polishing Pads	1 micron or finer final polishing diamond or alumina	
	NAPPAD Polishing Pad - this is another high napped final polishing pad useful for most metals and polymers. It has a higher nap than MICROPAD, providing it with a very gentle polishing action which is very useful for polishing soft materials such as copper, aluminum and austenitic steels	Alumina or colloidal silica polishing	
	MOLTEC 2 Polishing Pad - this is wool polishing cloth used for final polishing and has a very high nap. It is most commonly used for final polishing metals where edge retention is a minimal consideration	Alumina or colloidal silica polishing	
	FELT PAD Polishing Pad - this is a thick felt pad used for final polishing glass and large surface area parts	Alumina or colloidal silica polishing	

POLISHING PADS (8 & 9-inch)

8-inch Polishing Pads with PSA Adhesive-Backing

PACE Product Name	Catalog Number	Qty
Rough Polishing		
8-inch CERMESH metal mesh cloth (5/pkg)	CMESH-2008	5/pkg
8-inch POLYPAD polishing pad (10/pkg)	PP-6008	10/pkg
Intermediate Diamond Polishing		
8-inch TEXPAN polishing pad (10/pkg)	TP-5008	10/pkg
8-inch DACRON II® polishing pad (5/pkg)	DC2-3008	5/pkg
8-inch NYPAD polishing pad (10/pkg)	NY-3008	10/pkg
8-inch GOLDPAD polishing pad (10/pkg)	GP-4008	10/pkg
8-inch ATLANTIS polishing pad (5/pkg)	ATL-3008	5/pkg
Final Polishing		
8-inch TRICOTE polishing pad (10/pkg)	TRI-4008	10/pkg
8-inch MICROPAD polishing pad (10/pkg)	MP-9008	10/pkg
8-inch NAPPAD polishing pad (10/pkg)	NP-7008	10/pkg
8-inch MOLTEC 2 polishing pad (5/pkg)	MT2-7008	5/pkg
8-inch FELTPAD polishing pad (5/pkg)	FP-8125-08	5/pkg
CMP Polishing		
8-inch Black CHEM 2 polishing pad (10/pkg)	BC2-8008	10/pkg



8-inch Polishing Pads with Magnetic Stainless Steel-Backing

PACE Product Name	Catalog Number	Qty
Rough Polishing		
8-inch CERMESH magnetic stainless steel metal mesh cloth (5/pkg)	CMESH-2008-SSMAG	5/pkg
8-inch POLYPAD magnetic stainless steel polishing pad (5/pkg)	PP-6008-SSMAG	5/pkg
Intermediate Diamond Polishing		
8-inch TEXPAN magnetic stainless steel polishing pad (5/pkg)	TP-5008-SSMAG	5/pkg
8-inch DACRON II® magnetic stainless steel polishing pad (5/pkg)	DC2-3008-SSMAG	5/pkg
8-inch NYPAD magnetic stainless steel polishing pad (5/pkg)	NY-3008-SSMAG	5/pkg
8-inch GOLDPAD magnetic stainless steel polishing pad (5/pkg)	GP-4008-SSMAG	5/pkg
8-inch ATLANTIS magnetic stainless steel polishing pad (5/pkg)	ATL-3008-SSMAG	5/pkg
Final Polishing		
8-inch TRICOTE magnetic stainless steel polishing pad (5/pkg)	TRI-4008-SSMAG	5/pkg
8-inch MICROPAD magnetic stainless steel polishing pad (5/pkg)	MP-9008-SSMAG	5/pkg
8-inch NAPPAD magnetic stainless steel polishing pad (5/pkg)	NP-7008-SSMAG	5/pkg
8-inch MOLTEC 2 magnetic stainless steel polishing pad (5/pkg)	MT2-7008-SSMAG	5/pkg
8-inch FELTPAD magnetic stainless steel polishing pad (5/pkg)	FP-8125-08-SSMAG	5/pkg
CMP Polishing		
8-inch Black CHEM 2 magnetic stainless steel polishing pad (5/pkg)	BC2-8008-SSMAG	5/pkg

8-inch Polishing Pads with Magnetic Rubber-Backing

PACE Product Name	Catalog Number	Qty
Rough Polishing		
8-inch CERMESH magnetic rubber metal mesh cloth (5/pkg)	CMESH-2008-MAG	5/pkg
8-inch POLYPAD magnetic rubber polishing pad (5/pkg)	PP-6008-MAG	5/pkg
Intermediate Diamond Polishing		
8-inch TEXPAN magnetic rubber polishing pad (5/pkg)	TP-5008-MAG	5/pkg
8-inch DACRON II® magnetic rubber polishing pad (5/pkg)	DC2-3008-MAG	5/pkg
8-inch NYPAD magnetic rubber polishing pad (5/pkg)	NY-3008-MAG	5/pkg
8-inch GOLDPAD magnetic rubber polishing pad (5/pkg)	GP-4008-MAG	5/pkg
8-inch ATLANTIS magnetic rubber polishing pad (5/pkg)	ATL-3008-MAG	5/pkg
Final Polishing		
8-inch TRICOTE magnetic rubber polishing pad (5/pkg)	TRI-4008-MAG	5/pkg
8-inch MICROPAD magnetic rubber polishing pad (5/pkg)	MP-9008-MAG	5/pkg
8-inch NAPPAD magnetic rubber polishing pad (5/pkg)	NP-7008-MAG	5/pkg
8-inch MOLTEC 2 magnetic rubber polishing pad (5/pkg)	MT2-7008-MAG	5/pkg
8-inch FELTPAD magnetic rubber polishing pad (5/pkg)	FP-8125-08-MAG	5/pkg
CMP Polishing		
8-inch Black CHEM 2 magnetic rubber polishing pad (5/pkg)	BC2-8008-MAG	5/pkg



9-inch Polishing Pads with PSA Adhesive-Backing

PACE Product Name	Catalog Number	Qty
Rough Polishing		
9-inch CERMESH metal mesh cloth (5/pkg)	CMESH-2009	5/pkg
9-inch POLYPAD polishing pad (10/pkg)	PP-6009	10/pkg
Intermediate Diamond Polishing		
9-inch TEXPAN polishing pad (10/pkg)	TP-5009	10/pkg
9-inch NYPAD polishing pad (10/pkg)	NY-3009	10/pkg
9-inch GOLDPAD polishing pad (10/pkg)	GP-4009	10/pkg
9-inch ATLANTIS polishing pad (5/pkg)	ATL-3009	5/pkg
Final Polishing		
9-inch TRICOTE polishing pad (10/pkg)	TRI-4009	10/pkg
9-inch MICROPAD polishing pad (10/pkg)	MP-9009	10/pkg
9-inch NAPPAD polishing pad (10/pkg)	NP-7009	10/pkg
9-inch MOLTEC 2 polishing pad (5/pkg)	MT2-7009	5/pkg
9-inch FELTPAD polishing pad (5/pkg)	FP-8125-09	5/pkg
CMP Polishing		
9-inch Black CHEM 2 polishing pad (10/pkg)	BC2-8009	10/pkg

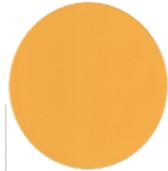
POLISHING PADS (10-inch)

10-inch Polishing Pads with PSA Adhesive-Backing

PACE Product Name	Catalog Number	Qty
Rough Polishing		
10-inch CERMESH metal mesh cloth (5/pkg)	CMESH-2010	5/pkg
10-inch POLYPAD polishing pad (10/pkg)	PP-6010	10/pkg
Intermediate Diamond Polishing		
10-inch TEXPAN polishing pad (10/pkg)	TP-5010	10/pkg
10-inch DACRON II® polishing pad (5/pkg)	DC2-3010	5/pkg
10-inch NYPAD polishing pad (10/pkg)	NY-3010	10/pkg
10-inch GOLDPAD polishing pad (10/pkg)	GP-4010	10/pkg
10-inch ATLANTIS polishing pad (5/pkg)	ATL-3010	5/pkg
Final Polishing		
10-inch TRICOTE polishing pad (10/pkg)	TRI-4010	10/pkg
10-inch MICROPAD polishing pad (10/pkg)	MP-9010	10/pkg
10-inch NAPPAD polishing pad (10/pkg)	NP-7010	10/pkg
10-inch MOLTEC 2 polishing pad (5/pkg)	MT2-7010	5/pkg
10-inch FELTPAD polishing pad (5/pkg)	FP-8125-10	5/pkg
CMP Polishing		
10-inch Black CHEM 2 polishing pad (10/pkg)	BC2-8010	10/pkg



10-inch Black CHEM 2 Pad
Catalog no. **BC2-8010**



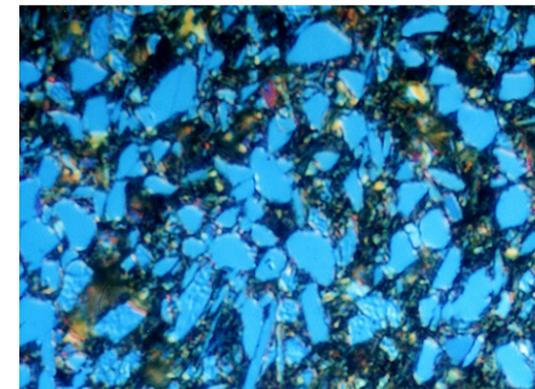
10-inch GOLDPAD Pad
Catalog no. **GP-4010**

10-inch Polishing Pads with Magnetic Rubber-Backing

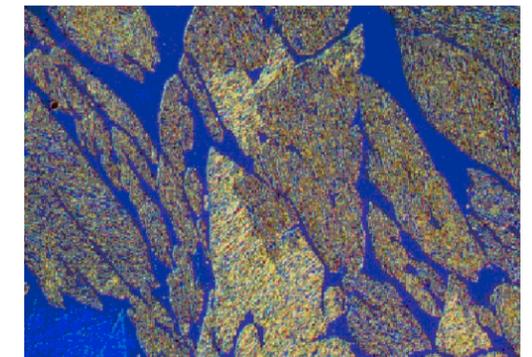
PACE Product Name	Catalog Number	Qty
Rough Polishing		
10-inch CERMESH magnetic rubber metal mesh cloth (5/pkg)	CMESH-2010-MAG	5/pkg
10-inch POLYPAD magnetic rubber polishing pad (5/pkg)	PP-6010-MAG	5/pkg
Intermediate Diamond Polishing		
10-inch TEXPAN magnetic rubber polishing pad (5/pkg)	TP-5010-MAG	5/pkg
10-inch DACRON II® magnetic rubber polishing pad (5/pkg)	DC2-3010-MAG	5/pkg
10-inch NYPAD magnetic rubber polishing pad (5/pkg)	NY-3010-MAG	5/pkg
10-inch GOLDPAD magnetic rubber polishing pad (5/pkg)	GP-4010-MAG	5/pkg
10-inch ATLANTIS magnetic rubber polishing pad (5/pkg)	ATL-3010-MAG	5/pkg
Final Polishing		
10-inch TRICOTE magnetic rubber polishing pad (5/pkg)	TRI-4010-MAG	5/pkg
10-inch MICROPAD magnetic rubber polishing pad (5/pkg)	MP-9010-MAG	5/pkg
10-inch NAPPAD magnetic rubber polishing pad (5/pkg)	NP-7010-MAG	5/pkg
10-inch MOLTEC 2 magnetic rubber polishing pad (5/pkg)	MT2-7010-MAG	5/pkg
10-inch FELTPAD magnetic rubber polishing pad (5/pkg)	FP-8125-10-MAG	5/pkg
CMP Polishing		
10-inch Black CHEM 2 magnetic rubber polishing pad (5/pkg)	BC2-8010-MAG	5/pkg

10-inch Polishing Pads with Magnetic Stainless Steel-Backing

PACE Product Name	Catalog Number	Qty
Rough Polishing		
10-inch CERMESH magnetic stainless steel metal mesh cloth (5/pkg)	CMESH-2010-SSMAG	5/pkg
10-inch POLYPAD magnetic stainless steel polishing pad (5/pkg)	PP-6010-SSMAG	5/pkg
Intermediate Diamond Polishing		
10-inch TEXPAN magnetic stainless steel polishing pad (5/pkg)	TP-5010-SSMAG	5/pkg
10-inch DACRON II® magnetic stainless steel polishing pad (5/pkg)	DC2-3010-SSMAG	5/pkg
10-inch NYPAD magnetic stainless steel polishing pad (5/pkg)	NY-3010-SSMAG	5/pkg
10-inch GOLDPAD magnetic stainless steel polishing pad (5/pkg)	GP-4010-SSMAG	5/pkg
10-inch ATLANTIS magnetic stainless steel polishing pad (5/pkg)	ATL-3010-SSMAG	5/pkg
Final Polishing		
10-inch TRICOTE magnetic stainless steel polishing pad (5/pkg)	TRI-4010-SSMAG	5/pkg
10-inch MICROPAD magnetic stainless steel polishing pad (5/pkg)	MP-9010-SSMAG	5/pkg
10-inch NAPPAD magnetic stainless steel polishing pad (5/pkg)	NP-7010-SSMAG	5/pkg
10-inch MOLTEC 2 magnetic stainless steel polishing pad (5/pkg)	MT2-7010-SSMAG	5/pkg
10-inch FELTPAD magnetic stainless steel polishing pad (5/pkg)	FP-8125-10-SSMAG	5/pkg
CMP Polishing		
10-inch Black CHEM 2 magnetic stainless steel polishing pad (5/pkg)	BC2-8010-SSMAG	5/pkg



Zirconium Diboride particles in a Titanium Matrix, etched, 1000X (DIC)



431 Stainless Steel, mag. 400X, etched with Modified Murakami's

POLISHING PADS (12-inch)

12-inch Polishing Pads with PSA Adhesive-Backing

PACE Product Name	Catalog Number	Qty
Rough Polishing		
12-inch CERMESH metal mesh cloth (5/pkg)	CMESH-2012	5/pkg
12-inch POLYPAD polishing pad (10/pkg)	PP-6012	10/pkg
Intermediate Diamond Polishing		
12-inch TEXPAN polishing pad (10/pkg)	TP-5012	10/pkg
12-inch DACRON II® polishing pad (5/pkg)	DC2-3012	5/pkg
12-inch NYPAD polishing pad (10/pkg)	NY-3012	10/pkg
12-inch GOLDPAD polishing pad (10/pkg)	GP-4012	10/pkg
12-inch ATLANTIS polishing pad (5/pkg)	ATL-3012	5/pkg
Final Polishing		
12-inch TRICOTE polishing pad (10/pkg)	TRI-4012	10/pkg
12-inch MICROPAD polishing pad (10/pkg)	MP-9012	10/pkg
12-inch NAPPAD polishing pad (10/pkg)	NP-7012	10/pkg
12-inch MOLTEC 2 polishing pad (5/pkg)	MT2-7012	5/pkg
12-inch FELTPAD polishing pad (5/pkg)	FP-8125-12	5/pkg
CMP Polishing		
12-inch Black CHEM 2 polishing pad (10/pkg)	BC2-8012	10/pkg



12-inch ATLANTIS Pad
Catalog no. **ATL-3012**



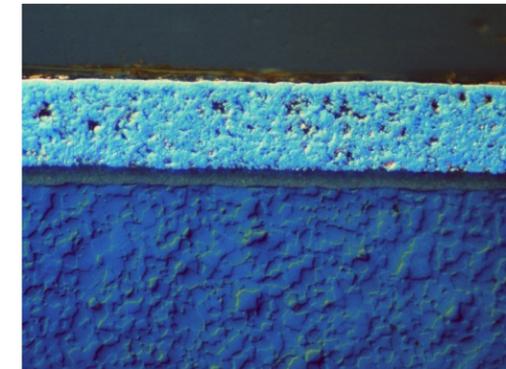
12-inch TRICOTE Pad
Catalog no. **TRI-4012**

12-inch Polishing Pads with Magnetic Rubber-Backing

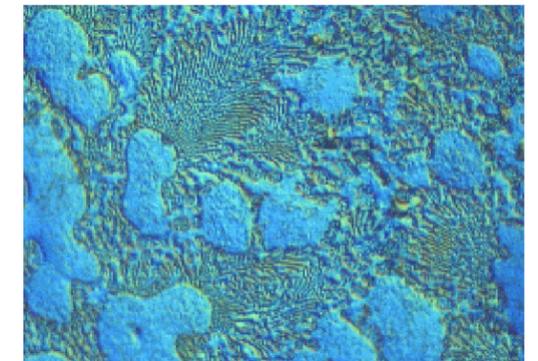
PACE Product Name	Catalog Number	Qty
Rough Polishing		
12-inch CERMESH magnetic rubber metal mesh cloth (5/pkg)	CMESH-2012-MAG	5/pkg
12-inch POLYPAD magnetic rubber polishing pad (5/pkg)	PP-6012-MAG	5/pkg
Intermediate Diamond Polishing		
12-inch TEXPAN magnetic rubber polishing pad (5/pkg)	TP-5012-MAG	5/pkg
12-inch DACRON II® magnetic rubber polishing pad (5/pkg)	DC2-3012-MAG	5/pkg
12-inch NYPAD magnetic rubber polishing pad (5/pkg)	NY-3012-MAG	5/pkg
12-inch GOLDPAD magnetic rubber polishing pad (5/pkg)	GP-4012-MAG	5/pkg
12-inch ATLANTIS magnetic rubber polishing pad (5/pkg)	ATL-3012-MAG	5/pkg
Final Polishing		
12-inch TRICOTE magnetic rubber polishing pad (5/pkg)	TRI-4012-MAG	5/pkg
12-inch MICROPAD magnetic rubber polishing pad (5/pkg)	MP-9012-MAG	5/pkg
12-inch NAPPAD magnetic rubber polishing pad (5/pkg)	NP-7012-MAG	5/pkg
12-inch MOLTEC 2 magnetic rubber polishing pad (5/pkg)	MT2-7012-MAG	5/pkg
12-inch FELTPAD magnetic rubber polishing pad (5/pkg)	FP-8125-12-MAG	5/pkg
CMP Polishing		
12-inch Black CHEM 2 magnetic rubber polishing pad (5/pkg)	BC2-8012-MAG	5/pkg

12-inch Polishing Pads with Magnetic Stainless Steel-Backing

PACE Product Name	Catalog Number	Qty
Rough Polishing		
12-inch CERMESH magnetic stainless steel metal mesh cloth (5/pkg)	CMESH-2012-SSMAG	5/pkg
12-inch POLYPAD magnetic stainless steel polishing pad (5/pkg)	PP-6012-SSMAG	5/pkg
Intermediate Diamond Polishing		
12-inch TEXPAN magnetic stainless steel polishing pad (5/pkg)	TP-5012-SSMAG	5/pkg
12-inch DACRON II® magnetic stainless steel polishing pad (5/pkg)	DC2-3012-SSMAG	5/pkg
12-inch NYPAD magnetic stainless steel polishing pad (5/pkg)	NY-3012-SSMAG	5/pkg
12-inch GOLDPAD magnetic stainless steel polishing pad (5/pkg)	GP-4012-SSMAG	5/pkg
12-inch ATLANTIS magnetic stainless steel polishing pad (5/pkg)	ATL-3012-SSMAG	5/pkg
Final Polishing		
12-inch TRICOTE magnetic stainless steel polishing pad (5/pkg)	TRI-4012-SSMAG	5/pkg
12-inch MICROPAD magnetic stainless steel polishing pad (5/pkg)	MP-9012-SSMAG	5/pkg
12-inch NAPPAD magnetic stainless steel polishing pad (5/pkg)	NP-7012-SSMAG	5/pkg
12-inch MOLTEC 2 magnetic stainless steel polishing pad (5/pkg)	MT2-7012-SSMAG	5/pkg
12-inch FELTPAD magnetic stainless steel polishing pad (5/pkg)	FP-8125-12-SSMAG	5/pkg
CMP Polishing		
12-inch Black CHEM 2 magnetic stainless steel polishing pad (5/pkg)	BC2-8012-SSMAG	5/pkg



AlN substrate with a molybdenum/ nickel, gold coating, 400X (DIC)



Zinc-Aluminum Alloy, 1000X DIC (etchant CrO3, Na2SO4)

POLISHING PADS (14-inch)

14-inch Polishing Pads with PSA Adhesive-Backing

PACE Product Name	Catalog Number	Qty
Rough Polishing		
14-inch CERMESH metal mesh cloth (5/pkg)	CMESH-2014	5/pkg
14-inch POLYPAD polishing pad (10/pkg)	PP-6014	10/pkg
Intermediate Diamond Polishing		
14-inch TEXPAN polishing pad (10/pkg)	TP-5014	10/pkg
14-inch DACRON II® polishing pad (5/pkg)	DC2-3014	5/pkg
14-inch NYPAD polishing pad (10/pkg)	NY-3014	10/pkg
14-inch GOLDPAD polishing pad (10/pkg)	GP-4014	10/pkg
14-inch ATLANTIS polishing pad (5/pkg)	ATL-3014	5/pkg
Final Polishing		
14-inch TRICOTE polishing pad (10/pkg)	TRI-4014	10/pkg
14-inch MICROPAD polishing pad (10/pkg)	MP-9014	10/pkg
14-inch NAPPAD polishing pad (10/pkg)	NP-7014	10/pkg
14-inch MOLTEC 2 polishing pad (5/pkg)	MT2-7014	5/pkg
14-inch FELTPAD polishing pad (5/pkg)	FP-8125-14	5/pkg
CMP Polishing		
14-inch Black CHEM 2 polishing pad (10/pkg)	BC2-8014	10/pkg



12-inch MICROPAD
Catalog no. **MP-9012**



12-inch FELTPAD
Catalog no. **FP-8125-12**

14-inch Polishing Pads with Magnetic Stainless Steel-Backing

PACE Product Name	Catalog Number
Rough Polishing	
14-inch CERMESH magnetic stainless steel metal mesh cloth (5/pkg)	CMESH-2014-SSMAG
14-inch POLYPAD magnetic stainless steel polishing pad (5/pkg)	PP-6014-SSMAG
Intermediate Diamond Polishing	
14-inch TEXPAN magnetic stainless steel polishing pad (5/pkg)	TP-5014-SSMAG
14-inch DACRON II® magnetic stainless steel polishing pad (5/pkg)	DC2-3014-SSMAG
14-inch NYPAD magnetic stainless steel polishing pad (5/pkg)	NY-3014-SSMAG
14-inch GOLDPAD magnetic stainless steel polishing pad (5/pkg)	GP-4014-SSMAG
14-inch ATLANTIS magnetic stainless steel polishing pad (5/pkg)	ATL-3014-SSMAG
Final Polishing	
14-inch TRICOTE magnetic stainless steel polishing pad (5/pkg)	TRI-4014-SSMAG
14-inch MICROPAD magnetic stainless steel polishing pad (5/pkg)	MP-9014-SSMAG
14-inch NAPPAD magnetic stainless steel polishing pad (5/pkg)	NP-7014-SSMAG
14-inch MOLTEC 2 magnetic stainless steel polishing pad (5/pkg)	MT2-7014-SSMAG
14-inch FELTPAD magnetic stainless steel polishing pad (5/pkg)	FP-8125-14-SSMAG
CMP Polishing	
14-inch Black CHEM 2 magnetic stainless steel polishing pad (5/pkg)	BC2-8014-SSMAG

14-inch Polishing Pads with Magnetic Rubber-Backing

PACE Product Name	Catalog Number	Qty
Rough Polishing		
14-inch CERMESH magnetic rubber metal mesh cloth (5/pkg)	CMESH-2014-MAG	5/pkg
14-inch POLYPAD magnetic rubber polishing pad (5/pkg)	PP-6014-MAG	5/pkg
Intermediate Diamond Polishing		
14-inch TEXPAN magnetic rubber polishing pad (5/pkg)	TP-5014-MAG	5/pkg
14-inch DACRON II® magnetic rubber polishing pad (5/pkg)	DC2-3014-MAG	5/pkg
14-inch NYPAD magnetic rubber polishing pad (5/pkg)	NY-3014-MAG	5/pkg
14-inch GOLDPAD magnetic rubber polishing pad (5/pkg)	GP-4014-MAG	5/pkg
14-inch ATLANTIS magnetic rubber polishing pad (5/pkg)	ATL-3014-MAG	5/pkg
Final Polishing		
14-inch TRICOTE magnetic rubber polishing pad (5/pkg)	TRI-4014-MAG	5/pkg
14-inch MICROPAD magnetic rubber polishing pad (5/pkg)	MP-9014-MAG	5/pkg
14-inch NAPPAD magnetic rubber polishing pad (5/pkg)	NP-7014-MAG	5/pkg
14-inch MOLTEC 2 magnetic rubber polishing pad (5/pkg)	MT2-7014-MAG	5/pkg
14-inch FELTPAD magnetic rubber polishing pad (5/pkg)	FP-8125-14-MAG	5/pkg
CMP Polishing		
14-inch Black CHEM 2 magnetic rubber polishing pad (5/pkg)	BC2-8014-MAG	5/pkg

Magnetic Base Disks and Plates

PACE Product Name	Catalog Number	Qty
8-inch MAGNETON Base Plate (PSA)	MAG-B08	each
10-inch MAGNETON Base Plate (PSA)	MAG-B10	each
12-inch MAGNETON Base Plate (PSA)	MAG-B12	each
14-inch MAGNETON Base Plate (PSA)	MAG-B14	each



MAGNETON
Base Plate



MAGNEPAD Stainless
Steel Base Plate

PACE Product Name	Catalog Number	Qty
8-inch MAGNEPAD Stainless Steel Magnetic Base Plate	SSMAG-P08	each
10-inch MAGNEPAD Stainless Steel Magnetic Base Plate	SSMAG-P10	each
12-inch MAGNEPAD Stainless Steel Magnetic Base Plate	SSMAG-P12	each
14-inch MAGNEPAD Stainless Steel Magnetic Base Plate	SSMAG-P14	each

PACE Product Name	Catalog Number	Qty
8-inch MAGNEPAD Teflon Coated Magnetic Base Plate	MAG-P08	each
10-inch MAGNEPAD Teflon Coated Magnetic Base Plate	MAG-P10	each
12-inch MAGNEPAD Teflon Coated Magnetic Base Plate	MAG-P12	each
14-inch MAGNEPAD Teflon Coated Magnetic Base Plate	MAG-P14	each



MAGNEPAD Coated
Base Plate

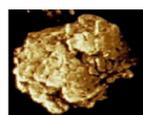
Diamond Polishing:

The majority of specimens will use at least one, if not multiple, diamond polishing steps. For metallographic specimen preparation either a man-made synthetic polycrystalline diamond or a monocrystalline diamond is used and the diamond is either mixed into a suspending solution or is used in a paste form. For metallography, diamond is coded by the following color scheme:

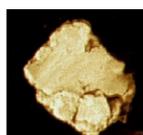


Polycrystalline Diamond:

Diamond is the hardest known material (Mohs 10, 8000 HV). It has a cubic crystal structure and is available in either natural or an artificial product. For metallographic applications, both monocrystalline and polycrystalline diamond can be used, however, polycrystalline diamond has a number of advantages over monocrystalline diamond, especially for the finer particle sizes.



Polycrystalline Diamond



Monocrystalline Diamond

Polycrystalline Diamond Advantages:

- Higher cut rates (self-sharpening abrasive)
- Uniform surface finish
- More uniform particle size distribution
- Harder / tougher particles
- Blocky shaped cutting edges
- Higher surface area (300% greater than monocrystalline diamond)
- Hexagonal microcrystallites (equally hard in all directions)

Polycrystalline Diamond Suspensions (1-liter Color Coded)

PACE Product Name	Catalog Number	Qty
1 micron (blue) DIAMAT PC diamond (1 liter)	PC-1001-1L	1-liter
3 micron (green) DIAMAT PC diamond (1 liter)	PC-1003-1L	1-liter
6 micron (yellow) DIAMAT PC diamond (1 liter)	PC-1006-1L	1-liter
9 micron (red) DIAMAT PC diamond (1 liter)	PC-1009-1L	1-liter
15 micron (brown) DIAMAT PC diamond (1 liter)	PC-1015-1L	1-liter
30 micron (orange) DIAMAT PC diamond (1 liter)	PC-1030-1L	1-liter
45 micron (purple) DIAMAT PC diamond (1 liter)	PC-1045-1L	1-liter



1 liter Dyed PC Diamond

Polycrystalline Diamond Suspensions (1-gallon Color Coded)

PACE Product Name	Catalog Number	Qty
1 micron (blue) DIAMAT PC diamond (1 gallon)	PC-1001-1GLB	1-gallon
3 micron (green) DIAMAT PC diamond (1 gallon)	PC-1003-1GLG	1-gallon
6 micron (yellow) DIAMAT PC diamond (1 gallon)	PC-1006-1GLY	1-gallon
9 micron (red) DIAMAT PC diamond (1 gallon)	PC-1009-1GLR	1-gallon
15 micron (brown) DIAMAT PC diamond (1 gallon)	PC-1015-1GLBR	1-gallon
30 micron (orange) DIAMAT PC diamond (1 gallon)	PC-1030-1GLO	1-gallon
45 micron (purple) DIAMAT PC diamond (1 gallon)	PC-1045-1GLP	1-gallon



1 gallon Dyed PC Diamond

High Viscosity Polycrystalline Diamond Suspensions



0.05 micron High Viscosity Polycrystalline Diamond



0.25 micron High Viscosity Polycrystalline Diamond



1 micron High Viscosity Polycrystalline Diamond

PACE Product Name	Catalog Number	Qty
0.05 micron high viscosity DIAMAT PC diamond (250 ml)	PC-0105-250	250 ml
0.05 micron high viscosity DIAMAT PC diamond (500 ml)	PC-0105-500	500 ml
0.05 micron high viscosity DIAMAT PC diamond (1 gallon)	PC-0105-1GL	1 gallon
0.05 micron high viscosity DIAMAT PC diamond (5 liters)	PC-0105-5L	5 liter
0.10 micron high viscosity DIAMAT PC diamond (250 ml)	PC-0110-250	250 ml
0.10 micron high viscosity DIAMAT PC diamond (500 ml)	PC-0110-500	500 ml
0.10 micron high viscosity DIAMAT PC diamond (1 gallon)	PC-0110-1GL	1 gallon
0.10 micron high viscosity DIAMAT PC diamond (5 liters)	PC-0110-5L	5 liter
0.25 micron high viscosity DIAMAT PC diamond (250 ml)	PC-0125-250	250 ml
0.25 micron high viscosity DIAMAT PC diamond (500 ml)	PC-0125-500	500 ml
0.25 micron high viscosity DIAMAT PC diamond (1 gallon)	PC-0125-1GL	1 gallon
0.25 micron high viscosity DIAMAT PC diamond (5 liters)	PC-0125-5L	5 liter
0.50 micron high viscosity DIAMAT PC diamond (250 ml)	PC-0150-250	250 ml
0.50 micron high viscosity DIAMAT PC diamond (500 ml)	PC-0150-500	500 ml
0.50 micron high viscosity DIAMAT PC diamond (1 gallon)	PC-0150-1GL	1 gallon
0.50 micron high viscosity DIAMAT PC diamond (5 liters)	PC-0150-5L	5 liter
1 micron high viscosity DIAMAT PC diamond (250 ml)	PC-1001-250	250 ml
1 micron high viscosity DIAMAT PC diamond (500 ml)	PC-1001-500	500 ml
1 micron high viscosity DIAMAT PC diamond (1 gallon)	PC-1001-1GL	1 gallon
1 micron high viscosity DIAMAT PC diamond (5 liters)	PC-1001-5L	5 liter
3 micron high viscosity DIAMAT PC diamond (250 ml)	PC-1003-250	250 ml
3 micron high viscosity DIAMAT PC diamond (500 ml)	PC-1003-500	500 ml
3 micron high viscosity DIAMAT PC diamond (1 gallon)	PC-1003-1GL	1 gallon
3 micron high viscosity DIAMAT PC diamond (5 liters)	PC-1003-5L	5 liter
6 micron high viscosity DIAMAT PC diamond (250 ml)	PC-1006-250	250 ml
6 micron high viscosity DIAMAT PC diamond (500 ml)	PC-1006-500	500 ml
6 micron high viscosity DIAMAT PC diamond (1 gallon)	PC-1006-1GL	1 gallon
6 micron high viscosity DIAMAT PC diamond (5 liters)	PC-1006-5L	5 liter

High Viscosity Polycrystalline Diamond Suspensions

PACE Product Name	Catalog Number	Qty
9 micron high viscosity DIAMAT PC diamond (250 ml)	PC-1009-250	250 ml
9 micron high viscosity DIAMAT PC diamond (500 ml)	PC-1009-500	500 ml
9 micron high viscosity DIAMAT PC diamond (1 gallon)	PC-1009-1GL	1 gallon
9 micron high viscosity DIAMAT PC diamond (5 liters)	PC-1009-5L	5 liter
15 micron high viscosity DIAMAT PC diamond (250 ml)	PC-1015-250	250 ml
15 micron high viscosity DIAMAT PC diamond (500 ml)	PC-1015-500	500 ml
15 micron high viscosity DIAMAT PC diamond (1 gallon)	PC-1015-1GL	1 gallon
15 micron high viscosity DIAMAT PC diamond (5 liters)	PC-1015-5L	5 liter
30 micron high viscosity DIAMAT PC diamond (250 ml)	PC-1030-250	250 ml
30 micron high viscosity DIAMAT PC diamond (500 ml)	PC-1030-500	500 ml
30 micron high viscosity DIAMAT PC diamond (1 gallon)	PC-1030-1GL	1 gallon
30 micron high viscosity DIAMAT PC diamond (5 liters)	PC-1030-5L	5 liter
45 micron high viscosity DIAMAT PC diamond (250 ml)	PC-1045-250	250 ml
45 micron high viscosity DIAMAT PC diamond (500 ml)	PC-1045-500	500 ml
45 micron high viscosity DIAMAT PC diamond (1 gallon)	PC-1045-1GL	1 gallon
45 micron high viscosity DIAMAT PC diamond (5 liters)	PC-1045-5L	5 liter



9 micron High Viscosity Polycrystalline Diamond



45 micron High Viscosity Polycrystalline Diamond

ZETA-2000S Abrasive Dispenser

- ◆ 4 (24v) dedicated, programmable peristaltic pumps
- ◆ Setting adjustments for frequency, duration, start time, total time
- ◆ 7-inch touchscreen interface
- ◆ Compatible with NANO polishing machines as well as competitors' polishing devices
- ◆ Controlled priming for each pump and dispensing lines for more immediate application of the abrasive / lubricant
- ◆ Flow 1.2~90 ml/minute
- ◆ Flex line for easy adjustment



ZETA-2000S Abrasive Dispenser

Polycrystalline Diamond Paste (5 gram syringes)



5 gram PC Diamond Paste

PACE Product Name	Catalog Number	Qty
0.10 micron polycrystalline diamond paste (5 grams)	PC-0210-05	5 grams
0.25 micron polycrystalline diamond paste (5 grams)	PC-0225-05	5 grams
0.50 micron polycrystalline diamond paste (5 grams)	PC-0250-05	5 grams
1 micron polycrystalline diamond paste (5 grams)	PC-2001-05	5 grams
3 micron polycrystalline diamond paste (5 grams)	PC-2003-05	5 grams
6 micron polycrystalline diamond paste (5 grams)	PC-2006-05	5 grams
9 micron polycrystalline diamond paste (5 grams)	PC-2009-05	5 grams
15 micron polycrystalline diamond paste (5 grams)	PC-2015-05	5 grams
30 micron polycrystalline diamond paste (5 grams)	PC-2030-05	5 grams
45 micron polycrystalline diamond paste (5 grams)	PC-2045-05	5 grams

Polycrystalline Diamond Paste (20 gram syringes)



20 gram PC Diamond Paste

PACE Product Name	Catalog Number	Qty
0.10 micron polycrystalline diamond paste (20 grams)	PC-0210-20	20 grams
0.25 micron polycrystalline diamond paste (20 grams)	PC-0225-20	20 grams
0.50 micron polycrystalline diamond paste (20 grams)	PC-0250-20	20 grams
1 micron polycrystalline diamond paste (20 grams)	PC-2001-20	20 grams
3 micron polycrystalline diamond paste (20 grams)	PC-2003-20	20 grams
6 micron polycrystalline diamond paste (20 grams)	PC-2006-20	20 grams
9 micron polycrystalline diamond paste (20 grams)	PC-2009-20	20 grams
15 micron polycrystalline diamond paste (20 grams)	PC-2015-20	20 grams
30 micron polycrystalline diamond paste (20 grams)	PC-2030-20	20 grams
45 micron polycrystalline diamond paste (20 grams)	PC-2045-20	20 grams

Diamond Polishing Pastes:

Diamond pastes have been and continue to be commonly used for hand or manual polishing steps because they are easy to apply and the diamond can be better charged or fixed into the polishing pad as compared to diamond suspensions. They are less commonly used on automated polishing machines because diamond suspensions are easier to apply and they also have a built-in lubricant. The use of diamond pastes requires the application of an additional diamond extender or lubricant, which is typically a glycol or alcohol based solution.

POLYCRYSTALLINE DIAMOND (LOW VISCOSITY)

Polycrystalline Diamond Suspensions (Low Viscosity)

PACE Product Name	Catalog Number	Qty
0.05 micron low viscosity DIAMAT PC diamond (250 ml)	GPC-0105-250	250 ml
0.05 micron low viscosity DIAMAT PC diamond (500 ml)	GPC-0105-500	500 ml
0.05 micron low viscosity DIAMAT PC diamond (1 gallon)	GPC-0105-1GL	1 gallon
0.05 micron low viscosity DIAMAT PC diamond (5 liters)	GPC-0105-5L	5 liter
0.10 micron low viscosity DIAMAT PC diamond (250 ml)	GPC-0110-250	250 ml
0.10 micron low viscosity DIAMAT PC diamond (500 ml)	GPC-0110-500	500 ml
0.10 micron low viscosity DIAMAT PC diamond (1 gallon)	GPC-0110-1GL	1 gallon
0.10 micron low viscosity DIAMAT PC diamond (5 liters)	GPC-0110-5L	5 liter
0.25 micron low viscosity DIAMAT PC diamond (250 ml)	GPC-0125-250	250 ml
0.25 micron low viscosity DIAMAT PC diamond (500 ml)	GPC-0125-500	500 ml
0.25 micron low viscosity DIAMAT PC diamond (1 gallon)	GPC-0125-1GL	1 gallon
0.25 micron low viscosity DIAMAT PC diamond (5 liters)	GPC-0125-5L	5 liter
0.50 micron low viscosity DIAMAT PC diamond (250 ml)	GPC-0150-250	250 ml
0.50 micron low viscosity DIAMAT PC diamond (500 ml)	GPC-0150-500	500 ml
0.50 micron low viscosity DIAMAT PC diamond (1 gallon)	GPC-0150-1GL	1 gallon
0.50 micron low viscosity DIAMAT PC diamond (5 liters)	GPC-0150-5L	5 liter
1 micron low viscosity DIAMAT PC diamond (250 ml)	GPC-1001-250	250 ml
1 micron low viscosity DIAMAT PC diamond (500 ml)	GPC-1001-500	500 ml
1 micron low viscosity DIAMAT PC diamond (1 gallon)	GPC-1001-1GL	1 gallon
1 micron low viscosity DIAMAT PC diamond (5 liters)	GPC-1001-5L	5 liter
3 micron low viscosity DIAMAT PC diamond (250 ml)	GPC-1003-250	250 ml
3 micron low viscosity DIAMAT PC diamond (500 ml)	GPC-1003-500	500 ml
3 micron low viscosity DIAMAT PC diamond (1 gallon)	GPC-1003-1GL	1 gallon
3 micron low viscosity DIAMAT PC diamond (5 liters)	GPC-1003-5L	5 liter
6 micron low viscosity DIAMAT PC diamond (250 ml)	GPC-1006-250	250 ml
6 micron low viscosity DIAMAT PC diamond (500 ml)	GPC-1006-500	500 ml
6 micron low viscosity DIAMAT PC diamond (1 gallon)	GPC-1006-1GL	1 gallon
6 micron low viscosity DIAMAT PC diamond (5 liters)	GPC-1006-5L	5 liter



0.10 micron Low Viscosity Polycrystalline Diamond



1 micron Low Viscosity Polycrystalline Diamond



3 micron Low Viscosity Polycrystalline Diamond



9 micron Low Viscosity Polycrystalline Diamond

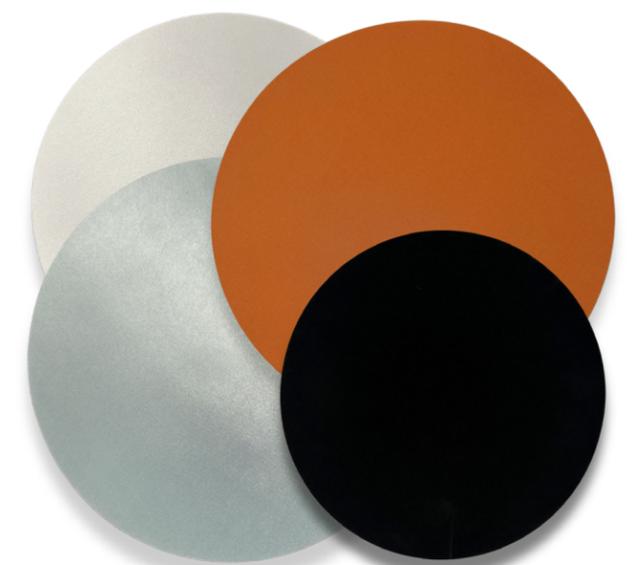


30 micron Low Viscosity Polycrystalline Diamond

PACE Product Name	Catalog Number	Qty
9 micron low viscosity DIAMAT PC diamond (250 ml)	GPC-1009-250	250 ml
9 micron low viscosity DIAMAT PC diamond (500 ml)	GPC-1009-500	500 ml
9 micron low viscosity DIAMAT PC diamond (1 gallon)	GPC-1009-1GL	1 gallon
9 micron low viscosity DIAMAT PC diamond (5 liters)	GPC-1009-5L	5 liter
15 micron low viscosity DIAMAT PC diamond (250 ml)	GPC-1015-250	250 ml
15 micron low viscosity DIAMAT PC diamond (500 ml)	GPC-1015-500	500 ml
15 micron low viscosity DIAMAT PC diamond (1 gallon)	GPC-1015-1GL	1 gallon
15 micron low viscosity DIAMAT PC diamond (5 liters)	GPC-1015-5L	5 liter
30 micron low viscosity DIAMAT PC diamond (250 ml)	GPC-1030-250	250 ml
30 micron low viscosity DIAMAT PC diamond (500 ml)	GPC-1030-500	500 ml
30 micron low viscosity DIAMAT PC diamond (1 gallon)	GPC-1030-1GL	1 gallon
30 micron low viscosity DIAMAT PC diamond (5 liters)	GPC-1030-5L	5 liter
45 micron low viscosity DIAMAT PC diamond (250 ml)	GPC-1045-250	250 ml
45 micron low viscosity DIAMAT PC diamond (500 ml)	GPC-1045-500	500 ml
45 micron low viscosity DIAMAT PC diamond (1 gallon)	GPC-1045-1GL	1 gallon
45 micron low viscosity DIAMAT PC diamond (5 liters)	GPC-1045-5L	5 liter

Polishing Pad Applications

- ◆ **Rough Polishing:** Coarse polishing with 15-45 micron abrasives
-CERMESH Metal Mesh cloth, POLYPAD Pad
- ◆ **Intermediate Polishing:** For removing most surface damage with 1-9 micron abrasives
-TEXPAN Pad, DACRON II Pad, NYPAD Pad, GOLDPAD Pad, ATLANTIS Pad (most popular)
- ◆ **Final Polishing:** For removing subsurface damage with 0.05-1 micron abrasives
-TRICOTE Pad, MICROPAD (most popular), NAPPAD Pad, MOLTEC 2 Pad, FELTPAD Pad
- ◆ **CMP Polishing:** CMP (chemical mechanical polishing with colloidal silica abrasives
-BLACK CHEM 2



POLYCRYSTALLINE DIAMOND (WATER-BASED)

Polycrystalline Water-Based Diamond Suspensions

Water-Based Polycrystalline Diamond Suspension Advantages:

- Higher diamond concentrations
- Faster material removal due to the multiple sharp cutting facets of polycrystalline diamonds
- Improved surface quality with fewer subsurface scratches compared to monocrystalline particles
- Better lubrication and cooling with water-based carriers, reducing heat and deformation
- Clean and easy cleanup, water-based suspensions rinse off without oily residue
- Environmentally safer than oil-based alternatives, with lower VOCs and improved lab safety
- Compatible with most polishing cloths and materials across metals, ceramics, and composites
- Consistent particle dispersion for uniform polishing results and repeatable performance
- Reduced polishing time when used in multi-step metallographic preparation routines

PACE Product Name	Catalog Number	Qty
0.05 micron water-based DIAMAT WPC diamond (250 ml)	WPC-0105-250	250 ml
0.05 micron water-based DIAMAT WPC diamond (500 ml)	WPC-0105-500	500 ml
0.05 micron water-based DIAMAT WPC diamond (1 gallon)	WPC-0105-1GL	1 gallon
0.05 micron water-based DIAMAT WPC diamond (5 liters)	WPC-0105-5L	5 liter
0.10 micron water-based DIAMAT WPC diamond (250 ml)	WPC-0110-250	250 ml
0.10 micron water-based DIAMAT WPC diamond (500 ml)	WPC-0110-500	500 ml
0.10 micron water-based DIAMAT WPC diamond (1 gallon)	WPC-0110-1GL	1 gallon
0.10 micron water-based DIAMAT WPC diamond (5 liters)	WPC-0110-5L	5 liter
0.25 micron water-based DIAMAT WPC diamond (250 ml)	WPC-0125-250	250 ml
0.25 micron water-based DIAMAT WPC diamond (500 ml)	WPC-0125-500	500 ml
0.25 micron water-based DIAMAT WPC diamond (1 gallon)	WPC-0125-1GL	1 gallon
0.25 micron water-based DIAMAT WPC diamond (5 liters)	WPC-0125-5L	5 liter
0.50 micron water-based DIAMAT WPC diamond (250 ml)	WPC-0150-250	250 ml
0.50 micron water-based DIAMAT WPC diamond (500 ml)	WPC-0150-500	500 ml
0.50 micron water-based DIAMAT WPC diamond (1 gallon)	WPC-0150-1GL	1 gallon
0.50 micron water-based DIAMAT WPC diamond (5 liters)	WPC-0150-5L	5 liter



0.05 micron Water-Based Polycrystalline Diamond



0.10 micron Water-Based Polycrystalline Diamond



0.25 micron Water-Based Polycrystalline Diamond



0.50 micron Water-Based Polycrystalline Diamond

Polycrystalline Water-Based Diamond Suspensions

PACE Product Name	Catalog Number	Qty
1 micron water-based DIAMAT WPC diamond (250 ml)	WPC-1001-250	250 ml
1 micron water-based DIAMAT WPC diamond (500 ml)	WPC-1001-500	500 ml
1 micron water-based DIAMAT WPC diamond (1 gallon)	WPC-1001-1GL	1 gallon
1 micron water-based DIAMAT WPC diamond (5 liters)	WPC-1001-5L	5 liter
3 micron water-based DIAMAT WPC diamond (250 ml)	WPC-1003-250	250 ml
3 micron water-based DIAMAT WPC diamond (500 ml)	WPC-1003-500	500 ml
3 micron water-based DIAMAT WPC diamond (1 gallon)	WPC-1003-1GL	1 gallon
3 micron water-based DIAMAT WPC diamond (5 liters)	WPC-1003-5L	5 liter
6 micron water-based DIAMAT WPC diamond (250 ml)	WPC-1006-250	250 ml
6 micron water-based DIAMAT WPC diamond (500 ml)	WPC-1006-500	500 ml
6 micron water-based DIAMAT WPC diamond (1 gallon)	WPC-1006-1GL	1 gallon
6 micron water-based DIAMAT WPC diamond (5 liters)	WPC-1006-5L	5 liter
9 micron water-based DIAMAT WPC diamond (250 ml)	WPC-1009-250	250 ml
9 micron water-based DIAMAT WPC diamond (500 ml)	WPC-1009-500	500 ml
9 micron water-based DIAMAT WPC diamond (1 gallon)	WPC-1009-1GL	1 gallon
9 micron water-based DIAMAT WPC diamond (5 liters)	WPC-1009-5L	5 liter
15 micron water-based DIAMAT WPC diamond (250 ml)	WPC-1015-250	250 ml
15 micron water-based DIAMAT WPC diamond (500 ml)	WPC-1015-500	500 ml
15 micron water-based DIAMAT WPC diamond (1 gallon)	WPC-1015-1GL	1 gallon
15 micron water-based DIAMAT WPC diamond (5 liters)	WPC-1015-5L	5 liter
30 micron water-based DIAMAT WPC diamond (250 ml)	WPC-1030-250	250 ml
30 micron water-based DIAMAT WPC diamond (500 ml)	WPC-1030-500	500 ml
30 micron water-based DIAMAT WPC diamond (1 gallon)	WPC-1030-1GL	1 gallon
30 micron water-based DIAMAT WPC diamond (5 liters)	WPC-1030-5L	5 liter
45 micron water-based DIAMAT WPC diamond (250 ml)	WPC-1045-250	250 ml
45 micron water-based DIAMAT WPC diamond (500 ml)	WPC-1045-500	500 ml
45 micron water-based DIAMAT WPC diamond (1 gallon)	WPC-1045-1GL	1 gallon
45 micron water-based DIAMAT WPC diamond (5 liters)	WPC-1045-5L	5 liter



1 micron Water-Based Polycrystalline Diamond



6 micron Water-Based Polycrystalline Diamond



15 micron Water-Based Polycrystalline Diamond



45 micron Water-Based Polycrystalline Diamond

Monocrystalline Diamond Suspensions (High Viscosity)

PACE Product Name	Catalog Number	Qty
1 micron high viscosity DIAMAT MA diamond (250 ml)	MA-1001-250	250 ml
1 micron high viscosity DIAMAT MA diamond (500 ml)	MA-1001-500	500 ml
1 micron high viscosity DIAMAT MA diamond (1 gallon)	MA-1001-1GL	1 gallon
1 micron high viscosity DIAMAT MA diamond (5 liters)	MA-1001-5L	5 liter
3 micron high viscosity DIAMAT MA diamond (250 ml)	MA-1003-250	250 ml
3 micron high viscosity DIAMAT MA diamond (500 ml)	MA-1003-500	500 ml
3 micron high viscosity DIAMAT MA diamond (1 gallon)	MA-1003-1GL	1 gallon
3 micron high viscosity DIAMAT MA diamond (5 liters)	MA-1003-5L	5 liter
6 micron high viscosity DIAMAT MA diamond (250 ml)	MA-1006-250	250 ml
6 micron high viscosity DIAMAT MA diamond (500 ml)	MA-1006-500	500 ml
6 micron high viscosity DIAMAT MA diamond (1 gallon)	MA-1006-1GL	1 gallon
6 micron high viscosity DIAMAT MA diamond (5 liters)	MA-1006-5L	5 liter
9 micron high viscosity DIAMAT MA diamond (250 ml)	MA-1009-250	250 ml
9 micron high viscosity DIAMAT MA diamond (500 ml)	MA-1009-500	500 ml
9 micron high viscosity DIAMAT MA diamond (1 gallon)	MA-1009-1GL	1 gallon
9 micron high viscosity DIAMAT MA diamond (5 liters)	MA-1009-5L	5 liter
15 micron high viscosity DIAMAT MA diamond (250 ml)	MA-1015-250	250 ml
15 micron high viscosity DIAMAT MA diamond (500 ml)	MA-1015-500	500 ml
15 micron high viscosity DIAMAT MA diamond (1 gallon)	MA-1015-1GL	1 gallon
15 micron high viscosity DIAMAT MA diamond (5 liters)	MA-1015-5L	5 liter
30 micron high viscosity DIAMAT MA diamond (250 ml)	MA-1030-250	250 ml
30 micron high viscosity DIAMAT MA diamond (500 ml)	MA-1030-500	500 ml
30 micron high viscosity DIAMAT MA diamond (1 gallon)	MA-1030-1GL	1 gallon
30 micron high viscosity DIAMAT MA diamond (5 liters)	MA-1030-5L	5 liter
45 micron high viscosity DIAMAT MA diamond (250 ml)	MA-1045-250	250 ml
45 micron high viscosity DIAMAT MA diamond (500 ml)	MA-1045-500	500 ml
45 micron high viscosity DIAMAT MA diamond (1 gallon)	MA-1045-1GL	1 gallon
45 micron high viscosity DIAMAT MA diamond (5 liters)	MA-1045-5L	5 liter



1 micron High Viscosity Monocrystalline Diamond



3 micron High Viscosity Monocrystalline Diamond



6 micron High Viscosity Monocrystalline Diamond

Monocrystalline Diamond Paste (5 gram syringes)

PACE Product Name	Catalog Number	Qty
0.25 micron monocrystalline diamond paste (5 grams)	MA-0225-05	5 grams
0.50 micron monocrystalline diamond paste (5 grams)	MA-0250-05	5 grams
1 micron monocrystalline diamond paste (5 grams)	MA-2001-05	5 grams
3 micron monocrystalline diamond paste (5 grams)	MA-2003-05	5 grams
6 micron monocrystalline diamond paste (5 grams)	MA-2006-05	5 grams
9 micron monocrystalline diamond paste (5 grams)	MA-2009-05	5 grams
15 micron monocrystalline diamond paste (5 grams)	MA-2015-05	5 grams
30 micron monocrystalline diamond paste (5 grams)	MA-2030-05	5 grams
45 micron monocrystalline diamond paste (5 grams)	MA-2045-05	5 grams



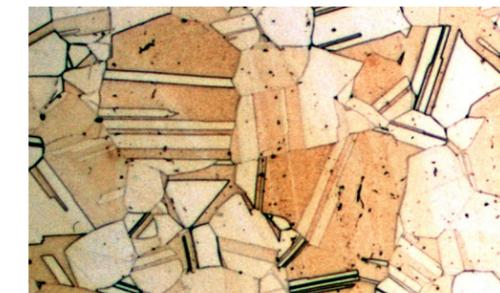
5 gram Monocrystalline Diamond Paste

Monocrystalline Diamond Paste (20 gram syringes)

PACE Product Name	Catalog Number	Qty
0.25 micron monocrystalline diamond paste (20 grams)	MA-0225-20	20 grams
0.50 micron monocrystalline diamond paste (20 grams)	MA-0250-20	20 grams
1 micron monocrystalline diamond paste (20 grams)	MA-2001-20	20 grams
3 micron monocrystalline diamond paste (20 grams)	MA-2003-20	20 grams
6 micron monocrystalline diamond paste (20 grams)	MA-2006-20	20 grams
9 micron monocrystalline diamond paste (20 grams)	MA-2009-20	20 grams
15 micron monocrystalline diamond paste (20 grams)	MA-2015-20	20 grams
30 micron monocrystalline diamond paste (20 grams)	MA-2030-20	20 grams
45 micron monocrystalline diamond paste (20 grams)	MA-2045-20	20 grams



20 gram Monocrystalline Diamond Paste



Twin Boundries in Brass

Monocrystalline Diamond Suspensions (Low Viscosity)

PACE Product Name	Catalog Number	Qty
1 micron low viscosity DIAMAT MA diamond (250 ml)	GMA-1001-250	250 ml
1 micron low viscosity DIAMAT MA diamond (500 ml)	GMA-1001-500	500 ml
1 micron low viscosity DIAMAT MA diamond (1 gallon)	GMA-1001-1GL	1 gallon
1 micron low viscosity DIAMAT MA diamond (5 liters)	GMA-1001-5L	5 liter
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3 micron low viscosity DIAMAT MA diamond (250 ml)	GMA-1003-250	250 ml
3 micron low viscosity DIAMAT MA diamond (500 ml)	GMA-1003-500	500 ml
3 micron low viscosity DIAMAT MA diamond (1 gallon)	GMA-1003-1GL	1 gallon
3 micron low viscosity DIAMAT MA diamond (5 liters)	GMA-1003-5L	5 liter
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6 micron low viscosity DIAMAT MA diamond (250 ml)	GMA-1006-250	250 ml
6 micron low viscosity DIAMAT MA diamond (500 ml)	GMA-1006-500	500 ml
6 micron low viscosity DIAMAT MA diamond (1 gallon)	GMA-1006-1GL	1 gallon
6 micron low viscosity DIAMAT MA diamond (5 liters)	GMA-1006-5L	5 liter
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9 micron low viscosity DIAMAT MA diamond (250 ml)	GMA-1009-250	250 ml
9 micron low viscosity DIAMAT MA diamond (500 ml)	GMA-1009-500	500 ml
9 micron low viscosity DIAMAT MA diamond (1 gallon)	GMA-1009-1GL	1 gallon
9 micron low viscosity DIAMAT MA diamond (5 liters)	GMA-1009-5L	5 liter
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15 micron low viscosity DIAMAT MA diamond (250 ml)	GMA-1015-250	250 ml
15 micron low viscosity DIAMAT MA diamond (500 ml)	GMA-1015-500	500 ml
15 micron low viscosity DIAMAT MA diamond (1 gallon)	GMA-1015-1GL	1 gallon
15 micron low viscosity DIAMAT MA diamond (5 liters)	GMA-1015-5L	5 liter
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30 micron low viscosity DIAMAT MA diamond (250 ml)	GMA-1030-250	250 ml
30 micron low viscosity DIAMAT MA diamond (500 ml)	GMA-1030-500	500 ml
30 micron low viscosity DIAMAT MA diamond (1 gallon)	GMA-1030-1GL	1 gallon
30 micron low viscosity DIAMAT MA diamond (5 liters)	GMA-1030-5L	5 liter
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45 micron low viscosity DIAMAT MA diamond (250 ml)	GMA-1045-250	250 ml
45 micron low viscosity DIAMAT MA diamond (500 ml)	GMA-1045-500	500 ml
45 micron low viscosity DIAMAT MA diamond (1 gallon)	GMA-1045-1GL	1 gallon
45 micron low viscosity DIAMAT MA diamond (5 liters)	GMA-1045-5L	5 liter



15 micron Low Viscosity Monocrystalline Diamond



30 micron Low Viscosity Monocrystalline Diamond



45 micron Low Viscosity Monocrystalline Diamond

Monocrystalline Water-Based Diamond Suspensions



Water-Based Monocrystalline Diamond Suspension Advantages:

- Higher diamond concentrations
- Provides controlled material removal due to the single-crystal structure, reducing the risk of excessive abrasion
- Yields a consistent and uniform scratch pattern, ideal for repeatable polishing results
- Offers excellent surface finish quality, especially in fine polishing and final preparation stages
- Minimizes subsurface damage on sensitive or softer materials during metallographic preparation
- Utilizes water-based carriers for effective cooling and lubrication, reducing heat-related deformation
- Cleans up easily with water, leaving no oily residue on samples or equipment
- Safer for users and the environment with lower volatile organic compound (VOC) emissions than oil-based products
- Features tightly controlled particle size distribution for predictable and reproducible polishing performance
- More cost-effective in some applications due to lower material removal, reducing over-polishing and rework
- Compatible with a wide range of polishing cloths and materials including metals, ceramics, and composites

Monocrystalline Water-Based Diamond Suspensions

PACE Product Name	Catalog Number	Qty
1 micron water-based DIAMAT WMA diamond (250 ml)	WMA-1001-250	250 ml
1 micron water-based DIAMAT WMA diamond (500 ml)	WMA-1001-500	500 ml
1 micron water-based DIAMAT WMA diamond (1 gallon)	WMA-1001-1GL	1 gallon
1 micron water-based DIAMAT WMA diamond (5 liters)	WMA-1001-5L	5 liter
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3 micron water-based DIAMAT WMA diamond (250 ml)	WMA-1003-250	250 ml
3 micron water-based DIAMAT WMA diamond (500 ml)	WMA-1003-500	500 ml
3 micron water-based DIAMAT WMA diamond (1 gallon)	WMA-1003-1GL	1 gallon
3 micron water-based DIAMAT WMA diamond (5 liters)	WMA-1003-5L	5 liter
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6 micron water-based DIAMAT WMA diamond (250 ml)	WMA-1006-250	250 ml
6 micron water-based DIAMAT WMA diamond (500 ml)	WMA-1006-500	500 ml
6 micron water-based DIAMAT WMA diamond (1 gallon)	WMA-1006-1GL	1 gallon
6 micron water-based DIAMAT WMA diamond (5 liters)	WMA-1006-5L	5 liter
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9 micron water-based DIAMAT WMA diamond (250 ml)	WMA-1009-250	250 ml
9 micron water-based DIAMAT WMA diamond (500 ml)	WMA-1009-500	500 ml
9 micron water-based DIAMAT WMA diamond (1 gallon)	WMA-1009-1GL	1 gallon
9 micron water-based DIAMAT WMA diamond (5 liters)	WMA-1009-5L	5 liter
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15 micron water-based DIAMAT WMA diamond (250 ml)	WMA-1015-250	250 ml
15 micron water-based DIAMAT WMA diamond (500 ml)	WMA-1015-500	500 ml
15 micron water-based DIAMAT WMA diamond (1 gallon)	WMA-1015-1GL	1 gallon
15 micron water-based DIAMAT WMA diamond (5 liters)	WMA-1015-5L	5 liter
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30 micron water-based DIAMAT WMA diamond (250 ml)	WMA-1030-250	250 ml
30 micron water-based DIAMAT WMA diamond (500 ml)	WMA-1030-500	500 ml
30 micron water-based DIAMAT WMA diamond (1 gallon)	WMA-1030-1GL	1 gallon
30 micron water-based DIAMAT WMA diamond (5 liters)	WMA-1030-5L	5 liter
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45 micron water-based DIAMAT WMA diamond (250 ml)	WMA-1045-250	250 ml
45 micron water-based DIAMAT WMA diamond (500 ml)	WMA-1045-500	500 ml
45 micron water-based DIAMAT WMA diamond (1 gallon)	WMA-1045-1GL	1 gallon
45 micron water-based DIAMAT WMA diamond (5 liters)	WMA-1045-5L	5 liter



1 micron Water-Based Monocrystalline Diamond



6 micron Water-Based Monocrystalline Diamond



15 micron Water-Based Monocrystalline Diamond



45 micron Water-Based Monocrystalline Diamond

Extenders / Lubricants:

Diamond lubricants or extenders are required for diamond pastes; however, they are also useful for thinning diamond suspensions. By alternating between the diamond suspension and the extender the diamond can better fall out of suspension and therefore embed into the polishing pad surface. Extenders / lubricants are typically glycol or alcohol based products.



Diamond Extenders / Lubricants

PACE Product Name	Catalog Number	Qty
DIALUBE water based lube (16 oz)	DL-3000-16	16 oz
DIALUBE water based lube (32 oz)	DL-3000-32	32 oz
DIALUBE water based lube (1/2 gallon)	DL-3000-64	1/2 gallon
DIALUBE water based lube (1 gallon)	DL-3000-128	1 gallon
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DIALUBE Blue alcohol based lube (32 oz)*	AOD-3000-32	32 oz
DIALUBE Blue alcohol based lube (1 gallon)*	AOD-3000-128	1 gallon
DIALUBE Blue alcohol based lube (5 gallons)*	AOD-3000-640	5 gallons
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DIALUBE Purple alcohol based lube (32 oz)*	ADL-3000-32	32 oz
DIALUBE Purple alcohol based lube (1 gallon)*	ADL-3000-128	1 gallon
DIALUBE Purple alcohol based lube (5 gallons)*	ADL-3000-640	5 gallons
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POLYLUBE non-aqueous lube (32 oz)	PDL-3000-32	32 oz
POLYLUBE non-aqueous lube (1 gallon)	PDL-3000-128	1 gallon
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POLYLUBE Red (anti-corrosion lube) (32 oz)	PDL-3000R-32	32 oz
POLYLUBE Red (anti-corrosion lube) (1 gallon)	PDL-3000R-128	1 gallon

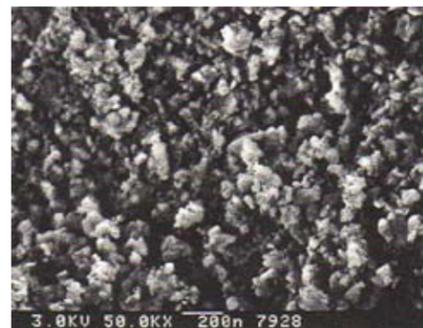
* May require dangerous goods shipping, extra charges may apply

Final Polishing:

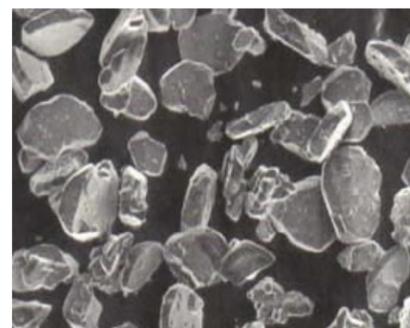
Final polishing can be accomplished with alumina, diamond, colloidal silica, ceria (cerium oxide) and rouge (iron oxide). However, the most commonly used abrasive for final polishing metals is alumina. Alumina abrasives are classified as calcined, levigated or polycrystalline based on their manufacturing process, crystal structure (hardness) and their sizing process.

Characteristics of Alumina Abrasives

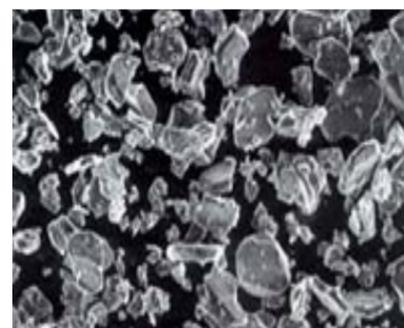
PROPERTY	POLYCRYSTALLINE	CALCINED	LEVIGATED
Crystal structure	Polycrystalline alpha alumina	Monocrystalline alpha alumina	Monocrystalline gamma or alpha alumina
Shape	Rough spherical particles	Hexagonal platelets	Hexagonal platelets
Particle size	0.05-0.25 microns	0.5-15 microns	<1 micron
Specific gravity	3.98 gm/cc	3.98 gm/cc	3.95 gm/cc (alpha) 3.6 gm/cc (gamma)
Hardness	Knoop 2000 (Mohs 9)	Knoop 2000 (Mohs 9)	Mohs 8-9
Applications	Available in a slurry at either a pH 4 or pH 10, primarily for metal polishing	Available in powders, slurries or suspensions, rough polishing	More commonly known as Linde A (0.3 micron) Linde B (0.05 micron) Linde C (1 micron)



Polycrystalline Alumina



Calcined Alumina



Levigated Alumina



NANOMETER Polycrystalline Alumina



Low Viscosity Alumina Slurry



Deagglomerated Alumina Powder

Polycrystalline Alumina:

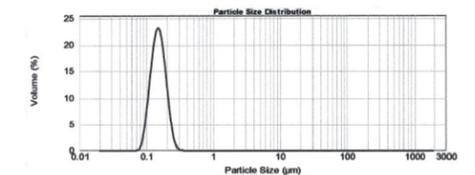
Polycrystalline or nanometer alumina is a colloidal alumina manufactured by a proprietary process. Polycrystalline abrasives are milled at either a low or higher pH value in order to avoid agglomeration which occurs near the point of zero charge (PZC). For alumina the PZC is around pH 7. This processing offers two significant improvements over conventional calcined alumina processes:

- ◆ Tighter, more controlled particle size distributions
- ◆ Harder alpha alumina crystal structure

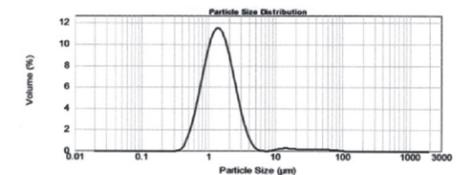
A tighter, more controlled particle size distribution is the result of less particle aggregation. For example, standard calcined 0.05 micron gamma alumina products form aggregate sizes as large as 5 microns. In some cases, these aggregates can be broken down during polishing with harder specimens; however, they are a problem when polishing softer metals (such as aluminum, tin, lead, copper and soft steels) with calcined alumina abrasives.

Nanometer polycrystalline alumina is specifically milled to produce a much smaller aggregate particle size distribution (<0.5 micron)(see PSD charts). Polycrystalline alumina is also a harder alpha alumina particle, therefore making it a more efficient cutting abrasive. Thus, polycrystalline alumina is a much more controlled polishing abrasive as compared to calcined gamma alumina abrasives.

In general, the more modern polycrystalline alumina abrasives outperform traditional calcined and levigated alumina abrasives for final polishing because they produce a much more consistent and better surface finish.



Particle size distribution for 0.05 micron NANOMETER Alumina



Particle size distribution for 0.05 micron Deagglomerated Alumina

Benefits of Polycrystalline Alumina:

- ◆ Improved surface finishes over gamma alumina
- ◆ Less random scratching
- ◆ Higher cutting rates than gamma alumina
- ◆ More uniform surface finish
- ◆ Tighter particle size distributions than gamma alumina
- ◆ Low viscosity for easier dispensing
- ◆ Semi-permanent suspensions

NANOMETER 0.05 micron Polycrystalline Alpha Alumina Slurries

PACE Product Name	Catalog Number	Qty
16 oz Nanometer alumina (pH 10)	NA-1005-16	16 oz
32 oz Nanometer alumina (pH 10)	NA-1005-32	32 oz
1/2 gallon Nanometer alumina (pH 10)	NA-1005-64	1/2 gallon
1 gallon Nanometer alumina (pH 10)	NA-1005-128	1 gallon
16 oz Acidic Nanometer alumina (pH 4)	NA-1020-16	16 oz
32 oz Acidic Nanometer alumina (pH 4)	NA-1020-32	32 oz
1/2 gallon Acidic Nanometer alumina (pH 4)	NA-1020-64	1/2 gallon
1 gallon Acidic Nanometer alumina (pH 4)	NA-1020-128	1 gallon

Performance Insights:

Alpha Alumina ($\alpha\text{-Al}_2\text{O}_3$)

- ◆ Cutting action: Sharp and crystalline; provides an aggressive, efficient polish on hard specimens.
- ◆ Best use: Final stages of metallographic preparation when a scratch-free, damage free surface are required.
- ◆ **Advantages:**
 - ◆ Produces excellent reflectivity and surface flatness.
 - ◆ High durability — maintains cutting ability over time.
 - ◆ Ideal for specimens with high hardness (e.g., tool steels, and carbides).
- ◆ **Drawback:**
 - ◆ Can be too aggressive for soft metals, potentially causing micro-scratches or relief.

Gamma Alumina ($\gamma\text{-Al}_2\text{O}_3$)

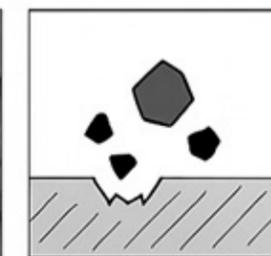
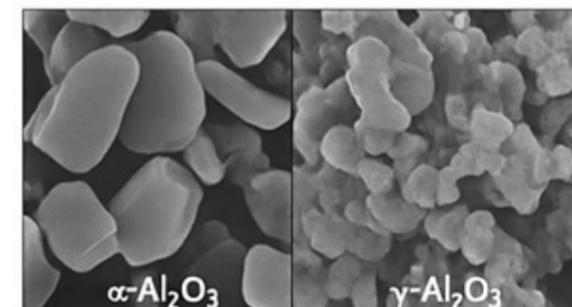
- ◆ Cutting action: Softer and less crystalline, with a polishing mechanism that relies on fine abrasion and chemical interaction.
- ◆ Best use: Intermediate or fine polishing of softer, ductile materials.
- ◆ **Advantages:**
 - ◆ Provides a gentle, controlled removal rate, reducing the risk of deformation.
 - ◆ High surface area aids in suspension stability, remains dispersed longer.
 - ◆ Can serve as a transition abrasive before switching to alpha alumina or colloidal silica.
- ◆ **Drawback:**
 - ◆ Limited cutting power for hard specimens.
 - ◆ Can leave a slight haze if used as the final step on very hard materials.

Alpha vs. Gamma Alumina as Metallographic Polishing Abrasives

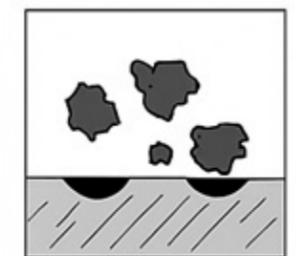
PROPERTY	$\alpha\text{-Al}_2\text{O}_3$ (Alpha Alumina)	$\gamma\text{-Al}_2\text{O}_3$ (Gamma Alumina)
Crystal structure	Corundum, hexagonal dense	Defective spinel, cubic, porous
Hardness (Mohs)	≈ 9	≈ 8
Density	High (≈3.98 g/cm ³)	Lower Irregular, fluffy (≈3.6 g/cm ³)
Particle shape	Crystalline, angular, plate-like	Irregular, fluffy, porous
Surface area	Low	Very high
Aggressiveness	Cuts and removes material quickly	Polishes by fine abrasion/adsorption
Final surface quality	Mirror-like, scratch-free	Fine matte or pre-polish finish
Typical use	Final or intermediate polishing of hard materials (ceramics, steels, tungsten carbide)	Initial to intermediate polishing, especially for softer metals and alloys (aluminum, copper, nickel)
Typical particle sizes	0.05-1.0 μm - Tends to settle faster (denser)	0.05-1.0 μm (but less cutting efficiency per size)
Suspension stability	Tends to settle faster (denser)	Suspends well in water due to lower density and higher surface area
Heat generation	More frictional heat	Cooler (less friction)

Summary Recommendation by Application

MATERIAL TYPE	Recommended Alumina	Typical Size (μm)	Remarks
Soft metals (Al, Cu, Ni)	$\gamma\text{-Al}_2\text{O}_3$	0.3-1.0	Gentle polishing, less deformation
Medium-hard steels	$\gamma \rightarrow \alpha$ (two-step)	0.3 → 0.05	Start with gamma, finish with alpha
Hard alloys, carbides, ceramics	$\alpha\text{-Al}_2\text{O}_3$	0.05-0.3	High-gloss finish, minimal scratches
Final mirror polish	$\alpha\text{-Al}_2\text{O}_3$ or colloidal silica	0.05	Scratch-free reflectivity



POLISHING EFFECT



POLISHING EFFECT

Alumina (Alpha) Slurries (ALPHA-NANO Low Viscosity, pH Controlled)

PACE Product Name	Catalog Number	Qty
0.05 micron Alpha Alumina Low Viscosity Polishing Slurry (6 oz) - pH 10	ALPHA-NANO-1005-06	6 oz
0.05 micron Alpha Alumina Low Viscosity Polishing Slurry (16 oz) - pH 10	ALPHA-NANO-1005-16	16 oz
0.05 micron Alpha Alumina Low Viscosity Polishing Slurry (32 oz) - pH 10	ALPHA-NANO-1005-32	32 oz
0.05 micron Alpha Alumina Low Viscosity Polishing Slurry (1/2 gallon) - pH 10	ALPHA-NANO-1005-64	1/2 gallon
0.05 micron Alpha Alumina Low Viscosity Polishing Slurry (1 gallon) - pH 10	ALPHA-NANO-1005-1G	1 gallon

Alpha Alumina Powders



PACE Product Name	Catalog Number	Qty
0.05 micron Alpha alumina powder (1 lb)	ALPHA-1005-01	1 lb
0.05 micron Alpha alumina powder (5 lbs)	ALPHA-1005-05	5 lbs

ALUMINA SLURRIES

Alumina (Gamma) Suspensions (For Electronics and Soft Materials - High Viscosity)

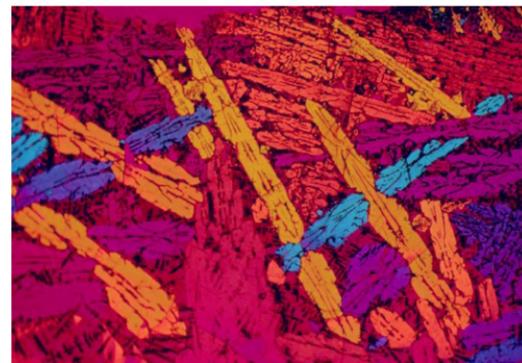
PACE Product Name	Catalog Number	Qty
0.05 micron Electronics Grade Deagglomerated Alumina (6 oz)	NANO2-1005-06E	6 oz
0.05 micron Electronics Grade Deagglomerated Alumina (16 oz)	NANO2-1005-16E	16 oz
0.05 micron Electronics Grade Deagglomerated Alumina (32 oz)	NANO2-1005-32E	32 oz
0.05 micron Electronics Grade Deagglomerated Alumina (1 gallon)	NANO2-1005-128E	1 gallon
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0.3 micron Electronics Grade Deagglomerated Alumina (6 oz)	NANO2-1003-06E	6 oz
0.3 micron Electronics Grade Deagglomerated Alumina (16 oz)	NANO2-1003-16E	16 oz
0.3 micron Electronics Grade Deagglomerated Alumina (32 oz)	NANO2-1003-32E	32 oz
0.3 micron Electronics Grade Deagglomerated Alumina (1 gallon)	NANO2-1003-128E	1 gallon
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1 micron Electronics Grade Deagglomerated Alumina (6 oz)	NANO2-1010-06E	6 oz
1 micron Electronics Grade Deagglomerated Alumina (16 oz)	NANO2-1010-16E	16 oz
1 micron Electronics Grade Deagglomerated Alumina (32 oz)	NANO2-1010-32E	32 oz
1 micron Electronics Grade Deagglomerated Alumina (1 gallon)	NANO2-1010-128E	1 gallon



Deagglomerated NANO2 Alumina Suspensions

Alumina Suspensions for Electronics and Soft Materials:

- ◆ Double deagglomerated processing
- ◆ Less random scratching
- ◆ More uniform surface finish
- ◆ Tighter particle size distributions
- ◆ High viscosity for manual dispensing
- ◆ Semi-permanent suspensions



Slag, 100X (Polarized light), as polished condition

Low Viscosity Alumina Suspensions:

- ◆ Low viscosity for easier dispensing
- ◆ Basic alumina polishing suspension ranging from 0.05 micron to 5 micron sizes
- ◆ Reasonably priced
- ◆ Traditional polishing compounds



Low Viscosity NANO Alumina Suspensions

Alumina Suspensions (NANO Low Viscosity)

PACE Product Name	Catalog Number	Qty
0.05 micron Alumina Low Viscosity Polishing Suspension (6 oz)	NANO-1005-06	6 oz
0.05 micron Alumina Low Viscosity Polishing Suspension (16 oz)	NANO-1005-16	16 oz
0.05 micron Alumina Low Viscosity Polishing Suspension (32 oz)	NANO-1005-32	32 oz
0.05 micron Alumina Low Viscosity Polishing Suspension (1 gallon)	NANO-1005-128	1 gallon
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0.3 micron Alumina Low Viscosity Polishing Suspension (6 oz)	NANO-1003-06	6 oz
0.3 micron Alumina Low Viscosity Polishing Suspension (16 oz)	NANO-1003-16	16 oz
0.3 micron Alumina Low Viscosity Polishing Suspension (32 oz)	NANO-1003-32	32 oz
0.3 micron Alumina Low Viscosity Polishing Suspension (1 gallon)	NANO-1003-128	1 gallon
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0.50 micron Alumina Low Viscosity Polishing Suspension (6 oz)	NANO-1105-06	6 oz
0.50 micron Alumina Low Viscosity Polishing Suspension (16 oz)	NANO-1105-16	16 oz
0.50 micron Alumina Low Viscosity Polishing Suspension (32 oz)	NANO-1105-32	32 oz
0.50 micron Alumina Low Viscosity Polishing Suspension (1 gallon)	NANO-1105-128	1 gallon
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1 micron Alumina Low Viscosity Polishing Suspension (6 oz)	NANO-1010-06	6 oz
1 micron Alumina Low Viscosity Polishing Suspension (16 oz)	NANO-1010-16	16 oz
1 micron Alumina Low Viscosity Polishing Suspension (32 oz)	NANO-1010-32	32 oz
1 micron Alumina Low Viscosity Polishing Suspension (1 gallon)	NANO-1010-128	1 gallon
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3 micron Alumina Low Viscosity Polishing Suspension (6 oz)	NANO-1030-06	6 oz
3 micron Alumina Low Viscosity Polishing Suspension (16 oz)	NANO-1030-16	16 oz
3 micron Alumina Low Viscosity Polishing Suspension (32 oz)	NANO-1030-32	32 oz
3 micron Alumina Low Viscosity Polishing Suspension (1 gallon)	NANO-1030-128	1 gallon
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5 micron Alumina Low Viscosity Polishing Suspension (6 oz)	NANO-1050-06	6 oz
5 micron Alumina Low Viscosity Polishing Suspension (16 oz)	NANO-1050-16	16 oz
5 micron Alumina Low Viscosity Polishing Suspension (32 oz)	NANO-1050-32	32 oz
5 micron Alumina Low Viscosity Polishing Suspension (1 gallon)	NANO-1050-128	1 gallon

Deagglomerated (Gamma) Alumina Powders (For Electronics and Soft Materials)

PACE Product Name	Catalog Number	Qty
0.05 micron electronics grade deagglomerated alumina powder (1 lb)	ALD-1005-01E (formerly ALR-1005-01E)	1 lb
0.05 micron electronics grade deagglomerated alumina powder (5 lbs)	ALD-1005-05E (formerly ALR-1005-05E)	5 lbs
0.3 micron electronics grade deagglomerated alumina powder (1 lb)	ALD-0103-01E (formerly ALR-0103-01E)	1 lb
0.3 micron electronics grade deagglomerated alumina powder (5 lbs)	ALD-0103-05E (formerly ALR-0103-05E)	5 lbs
1 micron electronics grade deagglomerated alumina powder (1 lb)	ALD-0110-01E (formerly ALR-0110-01E)	1 lb
1 micron electronics grade deagglomerated alumina powder (5 lbs)	ALD-0110-05E (formerly ALR-0110-05E)	5 lbs

Alumina Powders

PACE Product Name	Catalog Number	Qty
0.05 micron gamma deagglomerated alumina powder (1 lb)	ALD-1005-01	1 lb
0.05 micron gamma deagglomerated alumina powder (5 lbs)	ALD-1005-05	5 lbs
0.3 micron gamma deagglomerated alumina powder (1 lb)	ALD-0103-01	1 lb
0.3 micron gamma deagglomerated alumina powder (5 lbs)	ALD-0103-05	5 lbs
0.3 micron alpha alumina powder (1 lb)	ALR-0103-01	1 lb
0.3 micron alpha powder (5 lbs)	ALR-0103-05	5 lbs
0.5 micron alpha alumina powder (1 lb)	ALR-0105-01	1 lb
0.5 micron alpha alumina powder (5 lbs)	ALR-0105-05	5 lbs
1 micron alpha alumina powder (1 lb)	ALR-0110-01	1 lb
1 micron alpha alumina powder (5 lbs)	ALR-0110-05	5 lbs
3 micron alpha alumina powder (1 lb)	ALR-0130-01	1 lb
3 micron alpha alumina powder (5 lbs)	ALR-0130-05	5 lbs
5 micron alpha alumina powder (1 lb)	ALR-0150-01	1 lb
5 micron alpha alumina powder (5 lbs)	ALR-0150-05	5 lbs
9 micron alpha alumina powder (5 lbs)	ALR-0190-05	5 lbs
12 micron alpha alumina powder (5 lbs)	ALR-1200-05	5 lbs
15 micron alpha alumina powder (5 lbs)	ALR-1500-05	5 lbs
20 micron alpha alumina powder (5 lbs)	ALR-2000-05	5 lbs
30 micron alpha alumina powder (5 lbs)	ALR-3000-05	5 lbs
40 micron alpha alumina powder (5 lbs)	ALR-4000-05	5 lbs



Deagglomerated Fine Alumina Powders



Calcined Colloidal (<1 micron) Powders



Calcined Fine Alumina Powders



Coarse Alumina Powders

Cerium Oxide Polishing Compound

PACE Cerium Oxide Polishing Compound is a high-performance rare-earth fine polishing abrasive engineered for precision finishing and restoration of glass surfaces. It provides a superior balance of mechanical abrasion and chemical polishing, delivering exceptional clarity, surface smoothness, and defect removal on a wide variety of glass materials. This polishing abrasive suspension is formulated with optimized particle size and stable dispersion chemistry, ensuring consistent performance in both manual and automated polishing systems.

Applications:

This product is ideal for glass restoration, optical polishing, and precision finishing of surfaces like smartphone glass, display screens, and lenses. It's also used in scientific and industrial applications such as telescope mirrors, precision optics, and semiconductor wafers, and is effective for polishing metals, enamels, and gemstones (non-ferrous only).

Features & Benefits:

- ◆ High-purity cerium oxide (>99%) for scratch-free polishing.
- ◆ Controlled particle size for balanced removal rate and optical-grade finish.
- ◆ Stable dispersed slurry formula with pH-7 buffer and dispersant for long shelf life.
- ◆ Compatible with water or glycol-based systems.
- ◆ Works equally well for hand buffing or machine-assisted polishing.
- ◆ Produces a brilliant, clear finish without residue or haze.



CeO2 Oxide Glass Compound Powders & Suspensions

PACE Product Name	Catalog Number	Qty
CeO2 oxide glass polishing compound powder (1 lb)	CeO2-1P	1 lb
CeO2 oxide glass polishing compound powder (5 lbs)	CeO2-5P	5 lbs
PACE Product Name	Catalog Number	Qty
CeO2 oxide glass polishing compound slurry (6 oz)	CeO2-6S	6 oz
CeO2 oxide glass polishing compound slurry (16 oz)	CeO2-16S	16 oz
CeO2 oxide glass polishing compound slurry (32 oz)	CeO2-32S	32 oz
CeO2 oxide glass polishing compound slurry (1/2 gal)	CeO2-64S	1/2 gal
CeO2 oxide glass polishing compound slurry (1 gal)	CeO2-1GS	1 gal

CMP Slurry (Polycrystalline Alumina - Colloidal Silica Mixture)

Colloidal Silica and CMP Polishing Procedures:

Colloidal silica can be used alone or with harder abrasives (CMP polishing). For hard, brittle materials like glass and ceramics, polishing is primarily chemical; for metals, composites, and microelectronic components, it acts as a mechanical abrasive.

In CMP processes, the porous **BLACK CHEM 2** pad enhances chemical polishing by retaining heat, while **GOLDPAD** and **TEXPAN** pads are effective for glass, ceramics, and composites when using colloidal silica and diamond.

Colloidal silica suspensions are well-dispersed and uniform, ideal for polishing metals, though care must be taken to prevent drying, which can form larger crystallized particles. After polishing, immediately rinse with distilled water for 15-30 seconds to prevent abrasive crystallization. If residue forms, clean with a caustic solution such as NH₄OH + 30% H₂O₂.

Note: This solution may adversely react and etch copper and copper alloys.



PACE Product Name	Catalog Number	Qty
16 oz Chemical Mechanical Alumina-Silica Slurry - pH 10	CMP-1005-16	16 oz
32 oz Chemical Mechanical Alumina-Silica Slurry - pH 10	CMP-1005-32	32 oz
1/2 gallon Chemical Mechanical Alumina-Silica Slurry - pH 10	CMP-1005-64	1/2 gal

Colloidal Silica Polishing:

Colloidal silica abrasives for metallographic polishing typically range in particle size from 20 nm up to 70 nm (0.02-0.07 micron). The concentration of particles typically ranges between 25-50% solids. Even at these high concentrations, colloidal silica can be maintained in a nearly perfect suspension. The electrochemical stability of colloidal silica makes it an excellent chemical mechanical polishing abrasive for polishing ceramics. The main drawback to polishing with colloidal silica is that it will crystallize as it dehydrates. This is particularly troublesome around the lid of an open bottle. One way to reduce this crystallization is to add an ingredient to the colloidal silica suspension in order to reduce the evaporation rate of the water. A comparison of the two main types of colloidal silica, SIAMAT and SIAMAT 2 Colloidal Silica are listed in the following table.

Characteristics of Colloidal Silica Abrasives

PROPERTY	SIAMAT COLLOIDAL SILICA	SIAMAT 2 COLLOIDAL SILICA	SIAMAT BLUE COLLOIDAL SILICA
Particle Size	0.06 micron	0.02 micron	0.05 micron
pH	9.5-10.0	9.2-10.0	9.5-10.0
Concentration	45-50% solids	45-50% solids	45-50% solids
Specific gravity	1.39	1.25	1.39
Viscosity	15 cP	20 cP	15 cP
Applications	Precision surface finishing abrasive for ceramics and glass. Ideal as a CMP abrasive when used by itself or with diamond polishing abrasives	Precision surface finishing abrasive for metals and microelectronic materials	Similar to SIAMAT colloidal silica with blue dye added to distinguish the product from other abrasives suspensions

Colloidal Silica Polishing Suspensions

PACE Product Name	Catalog Number	Qty
16 oz SIAMAT colloidal silica (0.06 micron)	SI-100A-16	16 oz
32 oz SIAMAT colloidal silica (0.06 micron)	SI-100A-32	32 oz
1/2 gallon SIAMAT colloidal silica (0.06 micron)	SI-100A-64	1/2 gallon
1 gallon SIAMAT colloidal silica (0.06 micron)	SI-100A-128	1 gallon
5 gallons SIAMAT colloidal silica (0.06 micron)	SI-100A-640	5 gallons
16 oz SIAMAT Blue colloidal silica (0.05 micron)	SI-100B-16	16 oz
32 oz SIAMAT Blue colloidal silica (0.05 micron)	SI-100B-32	32 oz
1/2 gallon SIAMAT Blue colloidal silica (0.05 micron)	SI-100B-64	1/2 gallon
1 gallon SIAMAT Blue colloidal silica (0.05 micron)	SI-100B-128	1 gallon
5 gallons SIAMAT Blue colloidal silica (0.05 micron)	SI-100B-640	5 gallons
16 oz SIAMAT 2 colloidal silica (0.02 micron)	SI2-100A-16	16 oz
32 oz SIAMAT 2 colloidal silica (0.02 micron)	SI2-100A-32	32 oz
1/2 gallon SIAMAT 2 colloidal silica (0.02 micron)	SI2-100A-64	1/2 gallon
1 gallon SIAMAT 2 colloidal silica (0.02 micron)	SI2-100A-128	1 gallon
5 gallons SIAMAT 2 colloidal silica (0.02 micron)	SI2-100A-640	5 gallons



SIAMAT Colloidal Silica



SIAMAT Blue Colloidal Silica



Low Crystallizing SIAMAT 2 Colloidal Silica

UCLEAN-012 Ultrasonic Cleaner

FEATURE	UCLEAN-012 DESCRIPTION
Ultrasonic Frequency	40 KHz transducers
Ultrasonic Power	240 Watts
Timer	1-30 minutes
Heater	250W heating power
Maximum Temperature	176°F (80°C)
Volume of Tank	2.6 gallons (10 L)
Electrical specification	110 / 220V (50/60 Hz)
Volume of Tank	2.5 gallons (9.5 L)
Overall Dimensions (W x D x H)	13 x 11 x 11-inches (330 x 270 x 270 mm)
Tank Dimensions (W x D x H)	12 x 9.4 x 5.9 (300 x 240 x 150 mm)
Weight	14 lbs (6.3 kg)
Catalog Number	UCLEAN-012



Benefits:

- ◆ Reduces abrasive contamination in-between sample preparation steps
- ◆ With an IPA corrosion inhibitor specimens have less staining and etching

Cleaning:

Cleaning and drying are perhaps the most underrated processing steps in specimen preparation. Yet improper cleaning can lead to misleading results. Cleaning is required to remove polishing residue as well as particulates on the surface. Cleaning can be classified into two categories:

Intermediate Cleaning: It's important in order to minimize cross contamination of abrasives and swarf material. Intermediate cleaning is best accomplished with rinsing and ultrasonics. For the best results the specimen and holder should be pre-cleaned with water and a cotton swab to remove excess abrasive and swarf.

Final Cleaning: The most important cleaning step for removing residue prior to specimen examination. For difficult to clean specimens, ultrasonic cleaning in alcohol can be very helpful.

Cleaning / Drying / Storage Products

PACE Product Name	Catalog Number	Qty
ULTRACLEAN 2 Ultrasonic Degreasing / Cleaning Solution (32 oz)	UC2-1000-32	32 oz
ULTRACLEAN 2 Ultrasonic Degreasing / Cleaning Solution (1/2 gallon)	UC2-1000-64	1/2 gallon
ULTRACLEAN 2 Ultrasonic Degreasing / Cleaning Solution (1 gallon)	UC2-1000-128	1 gallon
Compressed Non-flammable gas	AIR-1000	each
Organic Corrosion Inhibitor (100X concentrate in IPA)	PCC-7500-032	32 oz
Urethane Spray Coating	URE-1000	each
1.25-inch Plastic Storage Container	STORE-0125	25/pkg

Etching:

Etching is a process for revealing the structure of the material, common etching techniques include: Chemical, Electrolytic, Thermal, Plasma, Molten salt and Magnetic etching. The two most common techniques are chemical and electrochemical etching. Chemical etching is typically a combination of either an acid or base with an oxidizing or reducing agent in a solute such as alcohol. Electrochemical etching is a combination of chemical etching with an electrical voltage/current.

ETCHANT	COMPOSITION	CONC.	CONDITIONS	COMMENTS
Adlers Etchant	Copper ammonium chloride Hydrochloric acid Ferric chloride, hydrated Distilled water	9 grams 150 ml 45 grams 75 ml	Immersion is recommended for 1-5 seconds	For etching 300 series stainless steel and other superalloys
Al-NaOH Etchant	Sodium hydroxide Distilled water	25 grams 250 ml water	Immersion is recommended for several seconds	For etching aluminum and zinc alloys
Ammonium Persulfate	Ammonium Persulfate Distilled water	50 grams 250 ml	Immersion is recommended for 1-5 seconds	For brasses, especially brasses containing Cobalt
ASTM No. 30	Ammonium hydroxide Hydrogen peroxide (3%) Distilled water	62.5 ml 125 ml 62.5 ml	Mix Ammonium hydroxide and water before adding peroxide. Must be used fresh. Swab 5-45 seconds	For etching copper, copper alloys and copper-silver alloys
ASTM 97 Etchant	Potassium hydroxide Distilled water	187.5 grams 250 ml	Electrolytic at 2.5 V for few seconds	Fe-Cr-Ni alloys - Stains sigma and chi yellow to red brown, ferrite gray to blue gray, carbides barely touched, austenite not touched
ASTM No. 157	Chromium (VI) oxide Hydrochloric acid Distilled water	31 grams 188 ml 62 ml	Immersion is recommended for several seconds	For etching tool steel - Colors ferrite, martensite, bainite, and pearlite. Cementite unaffected
Berahas	Distilled water Sodium thiosulfate Potassium metabisulfite	250 ml 25 grams 7.5 grams	Immersion is recommended for several seconds	For etching tool steel - Colors ferrite, martensite, bainite, and pearlite. Cementite unaffected
Carpenters Stainless Steel Etch	Ferric chloride, hydrated Cupric chloride Hydrochloric acid Nitric acid Denatured alcohol	8.5 grams 2.4 grams 122 ml 6 ml 122 ml	Immersion etching at 20°C	For etching duplex and 300 series stainless steels
CU-PASS-SOL	Copper sulfate Sulfuric acid Distilled water	40 grams 1.5 ml 244 ml	This test is recommended for the detection of free iron on the surface of austenitic stainless steels in the 200 and 300 series, precipitation hardened stainless steels, and ferritic 400 series stainless steels having a minimum of 16 % chromium. A copper color on the metal surface (brown or pinkish) indicates that surface iron is still present and thus the part fails the test. If no reaction occurs it is considered a test pass	
Dichromate	Sulfuric acid Distilled water Saturated Sodium chloride Potassium dichromate	36 ml 45 ml 18 ml 8.9 gram	Immersion (seconds to minutes)	Cu-Sn (tin bronze) etchant
Fry's Reagent	Hydrochloric acid Cupric Chloride Distilled water Denatured alcohol	100 ml 2.5 grams 75 ml 65 ml	Immersion (seconds to minutes)	Fry's reagent for martensitic and precipitation hardenable grades of stainless steel
Inconel Etchant	Distilled water Nitric acid Hydrochloric acid Hydrogen peroxide (30%)	90 ml 50 ml 75 ml 35 ml	Immersion etching at 20°C	For etching Inconel alloys
Kalling's No. 2	Cupric Chloride Hydrochloric acid Denatured alcohol	12 grams 125 ml 125 ml	Immersion or swabbing etch at 20°C	For etching duplex and 400 series stainless steels and Ni-Cu alloys and superalloys
Kellers Etch	Distilled water Nitric acid Hydrochloric acid Hydrofluoric acid	237 ml 6.1 ml 3.8 ml 2.4 ml	10-30 second immersion. Use only fresh etchant	Excellent for aluminum and titanium alloys

ETCHANT	COMPOSITION	CONC.	CONDITIONS	COMMENTS
Klemm's Reagent	Saturated sodium thiosulfate Potassium metabisulfite	250 ml 5 grams	Etch for a few seconds to minutes	For etching alpha-beta brass, bronze, tin, cast iron phosphides, ferrite, martensite, retained austenite, zinc and steel temper embrittlement
Klemms2	Saturated sodium thiosulfate Potassium metabisulfite	250 ml 25 grams	Immersion (seconds to minutes)	Dual phase tint etchant. Ferrite is light or dark blue, martensite brown and black, retained austenite white. Heating to 40°C will enhance the staining
Kroll's Reagent	Distilled water Nitric acid Hydrofluoric acid	230 ml 15 ml 5 ml	Swab specimen up to 20 seconds	Excellent for titanium and alloys
Marbles Reagent	Copper sulfate Hydrochloric acid Water	22 grams 125 ml 125 ml	Immerse or swab for 5-60 seconds.	For etching Ni, Ni-Cu and Ni-Fe alloys and superalloys. Add a few drops of H ₂ SO ₄ to increase activity
Murakami's	Potassium ferricyanide Potassium hydroxide Distill water	25 grams 25 grams 250 ml	CAUTION: Pre-mix KOH and water before adding K ₃ Fe(CN) ₆	Cr and alloys (use fresh and immerse); iron and steels reveals carbides; Mo and alloys uses fresh and immerse; Ni-Cu alloys for alpha phases use at 75°C; WC and alloys use fresh and immerse; WC-Co and complex sintered carbides
Nital (2-8%)	Denatured alcohol Nitric acid	230-245 ml 5-20 ml	Immersion up to a few minutes.	Most common etchant for iron, carbon and alloys steels and cast iron - Immerse sample for seconds to minutes; Mn-Fe, MnNi, Mn-Cu, Mn-Co alloys
Oberhoffers	Hydrochloric acid Cupric chloride Distilled water Denatured alcohol	100 ml 2.5 grams 75 ml 65 ml	Use fresh	Steels and special steels. Fe-enriched areas appear dark
Palmerton's	Chromium (VI) oxide Sodium sulfate Distilled Water	50 grams 4 grams 250 ml	Immerse sample up to 3 minutes. Rinse in 20% aq. CrO ₃	Very popular for pure Zn and alloys
Picral	Denatured alcohol Picric acid	250 ml 10 grams	Seconds to minutes Do not let etchant crystallize or dry	Recommended for microstructures containing ferrite, carbide, pearlite, martensite and bainite. Also useful for magnetic alloys, cast iron, high alloy stainless steels and magnesium
Ralphs Etchant	Distilled water Denatured alcohol Hydrochloric acid Cupric chloride Ferric chloride, hydrated	62.5 ml 125 ml 62.5 ml 1.25 grams 4.38 grams	Immersion (seconds to minutes)	Ferritic stainless steels
V2A Etchant	Distilled water Nitric Acid Hydrochloric acid	119 ml 12 ml 119 ml	Immersion is recommended for several seconds	Austenitic stainless steel etchant
Vilella's Reagent	Picric Acid Hydrochloric acid Ethanol	2.5 gram 7.5 ml 242 ml	Immersion or swabbing etch at 20°C	Effective for etching copper and copper alloys to reveal microstructure. Used to create a color contrast in the microstructure of certain alloys, making it easier to distinguish different phases
Wecks Copper Reagent	Potassium permanganate Sodium hydroxide Distilled water	12.5 grams 5 grams 250 ml	Immersion is recommended for several seconds	Austenitic stainless steel etchant
Wecks Nickel Reagent	Potassium permanganate Sodium hydroxide Distilled water	10 grams 2.5 grams 250 ml	Immersion or swabbing etch at 20°C	Used for etching nickel-based alloys, revealing grain structure and other microstructural details
Wecks No 1 Reagent	Potassium permanganate Sodium hydroxide Distilled water	10 grams 2.5 grams 250 ml	Immersion or swabbing etch at 20°C	Primarily used for aluminum and magnesium and their alloys to reveal grain boundaries, precipitates, and other microstructural features in aluminum alloys
Wecks No 2 Reagent	Potassium permanganate Sodium hydroxide Distilled wate	25 grams 25 grams 250 ml	Immersion or swabbing etch at v	Used for stainless steels, nickel-based alloys, and sometimes other metals to reveal grain boundaries, phases, and other microstructural features

ETCHANT	COMPOSITION	CONC.	CONDITIONS	COMMENTS
Wecks No. 3 Reagent	Potassium permanganate Sodium hydroxide Distilled water	10 grams 25 grams 250 ml	Immersion or swabbing etch at 20°C	Used for etching titanium alloys, stainless steels, and sometimes other resistant metals to reveal grain boundaries, phases, and other microstructural features, particularly in titanium alloys
Wecks No. 4 Reagent	Potassium permanganate Sodium hydroxide Distilled water	7.5 grams 5 grams 250 ml	Immersion or swabbing etch at 20°C	Commonly used for etching aluminum alloys, magnesium alloys, and sometimes other light metals to reveal grain boundaries, phases, and other microstructural features in these metals
Wecks No 5 Reagent.	Potassium permanganate Sodium hydroxide Distilled water	5 grams 25 grams 250 ml	Immersion or swabbing etch at 20°C	Typically used for less aggressive etching magnesium alloys, aluminum alloys, and sometimes other light metals to reveal grain boundaries, phases, and other microstructural features in these metals
Wecks No. 6 Reagent	Potassium permanganate Sodium hydroxide Distilled water	2.5 grams 25 grams 250 ml	Immersion or swabbing etch at 20°C	Mildest Wecks reagent, often used for etching magnesium alloys, aluminum alloys, and other light metals to gently reveal grain boundaries, phases, and other microstructural features in these metals
Wecks Titanium Reagent	Potassium permanganate Sodium hydroxide Distilled water	10 grams 2.5 grams 250 ml	Immersion or swabbing etch at 20°C	Used for etching titanium alloys, stainless steels, and sometimes other resistant metals to reveal grain boundaries, phases, and other microstructural features, particularly in titanium alloys
Wecks Zinc Reagent	Potassium permanganate Sodium hydroxide Distilled water	7.5 grams 2.5 grams 250 ml	Immersion or swabbing etch at 20°C	Used for etching zinc and zinc-based alloys
Winsteads Reagent	Picric acid thanol Distilled water Surfactant Hydrochloric acid	2 grams 10 ml 200 ml 5 ml 5 drops	Seconds to minutes	Low carbon steel - austenitic grain boundaries

Common Nickel, Iron, Chromium Alloy Etchants

PACE Product Name	Applications	Catalog Number	Qty
Adlers Etchant	Fe-based Superalloys	Adlers	250 ml
ASTM 97 Etchant	Fe-Cr-Ni alloys - Stains sigma and chi yellow to red brown, ferrite gray to blue gray, carbides barely touched, austenite not touched	ASTM 97	250 ml
ASTM 157 Etchant	Hastelloy alloys	ASTM 157	250 ml
Inconel Etch	Inconel alloys	Inconel	250 ml
Marbles Reagent	Nickel, nickel-iron alloys	Marbles	250 ml
Murakami's	Chromium alloys	Murakamis	250 ml
Waterless Kallings	Iron and nickel base alloys	Waterless Kallings	250 ml
Wecks Nickel Reagent	Used for etching nickel-based alloys, revealing grain structure and other microstructural details	Wecks Nickel Reagent	250 ml
Wecks No 2 Reagent	Used for stainless steels, nickel-based alloys, and sometimes other metals to reveal grain boundaries, phases, and other microstructural features	Wecks No 2 Reagent	250 ml

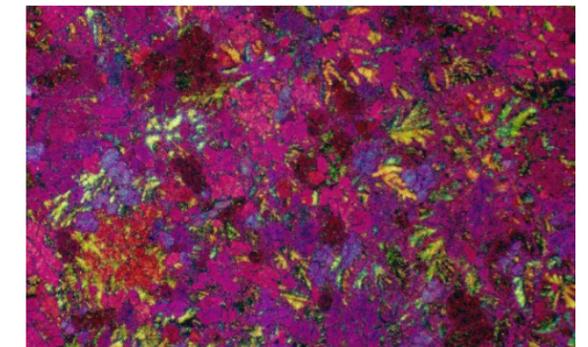


Common Aluminum and Titanium Etchants

PACE Product Name	Applications	Catalog Number	Qty
Al-NaOH Etchant	For etching aluminum and zinc alloys	Al-NaOH	250 ml
Kellers	Most common etchant for aluminum alloys	Kellers	250 ml
Kroll's	Most common etchant for titanium	Krolls	250 ml
Titanium Attack Polish	Used as a CMP polishing compound for titanium	TI-AP-16	500 ml
Wecks No. 1 Reagent	Primarily used for aluminum and magnesium and their alloys to reveal grain boundaries, precipitates, and other microstructural features in aluminum alloys	Wecks No 1 Reagent	250 ml
Wecks No. 3 Reagent	Used for stainless steels, nickel-based alloys, and sometimes other metals to reveal grain boundaries, phases, and other microstructural features	Wecks No 3 Reagent	250 ml
Wecks Titanium Reagent	Used for etching titanium alloys, stainless steels, and sometimes other resistant metals to reveal grain boundaries, phases, and other microstructural features, particularly in titanium alloys	Wecks Titanium Reagent	250 ml



Zinc-Aluminum Alloy, 200X B.F. (etchant CrO3, Na2SO4)



Zinc-Aluminum Alloy, 100X Polarized (etchant CrO3, Na2SO4)



Inconel 625, Etched with Adlers, Mag 200X

Common Copper and Brass Etchants

ETCHANT	Applications	Catalog Number	Qty
Ammonium Persulfate etchant	For brasses, especially brasses containing Cobalt	Ammonium Persulfate	250 ml
ASTM No. 30	Copper etchant	ASTM No. 30	250 ml
Copper No. 1	Copper & Brass (nitric acid and DI water)	Copper No. 1	250 ml
Copper No. 2	Copper & Brass (HCl and ferric chloride)	Copper No. 2	250 ml
Dichromate	Cu-Sn (tin bronze)	Dichromate	250 ml
Wecks Copper Reagent	Effective for etching copper and copper alloys to reveal microstructure. Used to create a color contrast in the microstructure of certain alloys, making it easier to distinguish different phases	Wecks Copper Reagent	250 ml
Klemms	Stain etch for brass	Klemms	250 ml



Common Stainless Steel Etchants

ETCHANT	Applications	Catalog Number	Qty
Adlers Etchant	Very effective for etching austenitic 300 series stainless steels	Adlers	250 ml
Carpenters	300 Series Stainless Steel Etchant	Carpenters	250 ml
CU-PASS-SOL	This test is recommended for the detection of free iron on the surface of austenitic stainless steels in the 200 and 300 series, precipitation hardened stainless steels, and ferritic 400 series stainless steels having a minimum of 16 % chromium. A copper color on the metal surface (brown or pinkish) indicates that surface iron is still present and thus the part fails the test. If no reaction occurs it is considered a test pass	CU-PASS-SOL	500 ml
Frys Reagent	Precipitation hardened stainless steels	Fry's Reagent	250 ml
Kalling's No. 2	Martensitic 400 series stainless steels	Kallings No. 2	250 ml
Ralphs Etchant	Ferritic stainless steels	Ralphs Etchant	250 ml
V2A	Austenitic stainless steels	V2A Etchant	250 ml
Wecks No 2 Reagent.	Used for stainless steels, nickel-based alloys, and sometimes other metals to reveal grain boundaries, phases, and other microstructural features	Wecks No 2 Reagent.	250 ml



Common Steel Etchants

ETCHANT	Applications	Catalog Number	Qty
2% Nital		Nital-2	250 ml
3% Nital	2% is the most common etchant for non-heat treated or welded steels	Nital-3	250 ml
5% Nital		Nital-5	250 ml
8% Nital		Nital-8	250 ml
Berahas	For etching tool steel - Colors ferrite, martensite, bainite, and pearlite. Cementite unaffected	Berahas	250 ml
Klemms2	Dual phase tint etchant. Ferrite is light or dark blue, martensite brown and black, retained austenite white. Heating to 40°C will enhance the staining	Klemms2	250 ml
Oberhoffers	Steels and special steels. Fe-enriched areas appear dark	Oberhoffers	250 ml
Picral	Heat treated steels	Picral	250 ml
Viellas	Most common etchant for carburized/ heat treated steels	Vilella's	250 ml
Winsteards	Low carbon steel - austenitic grain boundaries	Winsteards Reagent	250 ml



Zinc and Magnesium Etchants

ETCHANT	Applications	Catalog Number	Qty
Al-NaOH Etchant	For etching aluminum and zinc alloys	Al-NaOH	250 ml
2% Nital	Magnesium alloys	2% Nital	250 ml
Palmerton's	Very popular for pure Zn and alloys	Palmerton reagent	250 ml
Wecks Zinc Reagent	Used for etching zinc and zinc-based alloys	Wecks Zinc Reagent	250 ml
Wecks No 6 Reagent.	Mildest Wecks reagent, often used for etching magnesium alloys, aluminum alloys, and other light metals to gently reveal grain boundaries, phases, and other microstructural features in these metals	Wecks No. 6 Reagent	250 ml



Miscellaneous Etching Supplies

PACE Product Name	Catalog Number	Qty
6-inch Cotton Tipped Etchant Applicator	AP-SWAB-2	200/pkg





ALPHA-MHT-1000Z

ALPHA-MHT-1000Z

- Vickers or Knoop Indenters
- Auto-turret
- Built-in printer
- Load range 10-1000 grams
- Scales (HV, HK)
- LED display
- User friendly
- Robust and durable design



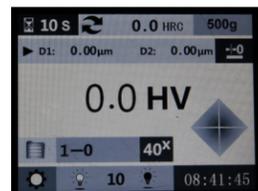
ALPHA-MHT-1000Z Control Panel



ALPHA-MHT-2000Z2

ALPHA-MHT-2000Z2

- Vickers or Knoop Indenters
- Auto-turret
- Built-in printer
- Load range 10-2000 grams
- Scales (HV, HK)
- Auto hardness conversion to other scales (HRA, HRB, HRC, HV, HK, HBW, etc)
- Long lasting Halogen lamp
- Touch screen display
- Robust and durable design



ALPHA-MHT-2000Z2 Touch Screen

CE EN 61000-6-1:2007, EN 61000-6-3:2007+A1:2011+AC:2012, EN 61000-3-2:2014, EN 61000-3-3:2013
Electromagnetic Compatibility directive 2014/30/EU

Microhardness Testers

Model Name	ALPHA-MHT-1000Z	ALPHA-MHT-2000Z2
Indenter types	Vickers or Knoop	Vickers or Knoop
Objective Magnification	10X (observation) & 40X (measurement)	10X (observation) & 40X (measurement)
Indenter Positioning	Auto turret	Auto turret
Testing force (gf)	10, 25, 50, 100, 200, 300, 400, 500, 1000	10, 25, 50, 100, 200, 300, 400, 500, 1000, 2000
Auto Hardness Conversion	HK, HRA, HRBW, HRC, HRD, HRGW, HRKW, HR15N, HR30N, HR45N, HR15TW, HR30TW, HR45TW, HBW	HK, HRA, HRBW, HRC, HRD, HRFW, HRGW, HRKW, HR15N, HR30N, HR45N, HR15TW, HR30TW, HR45TW, HS, HBW
Testing Range	1 HV ~ 3000 HV	1 HV ~ 3000 HV
X-Y Anvil Size	4 x 4-inch (100 x 100 mm)	4 x 4-inch (100 x 100 mm)
X-Y Anvil Travel	1 x 1-inch (25 x 25 mm)	1 x 1-inch (25 x 25 mm) ¹
Dwell Time	5-60 seconds	5-60 seconds
Maximum Sample Height	3.5-inches (90 mm)	3.5-inches (90 mm)
Throat Depth	4-inches (100 mm)	4-inches (100 mm)
Illumination	Halogen	Halogen
Dimensions (W x D x H)	12.8 x 19 x 21.5-inch (325 x 480 x 545 mm)	12.8 x 19 x 21.5-inch (325 x 480 x 545 mm)
Electrical Specifications	110V / 220V 50/60 Hz	110V / 220V 50/60 Hz
Weight	68 lbs (31 kg)	70 lbs (32 kg)
Microhardness indentation measurement software (optional)	HARDNESS PRO	HARDNESS PRO
C-Mount camera attachment (optional)	823-361	823-361
Sample leveler (optional)	823-741	823-741
Direct Certification (optional)	3rd Party	3rd Party
Catalog Number	ALPHA-MHT-1000Z	ALPHA-MHT-2000Z2

2 year warranty
Limited Warranty

Benefits:

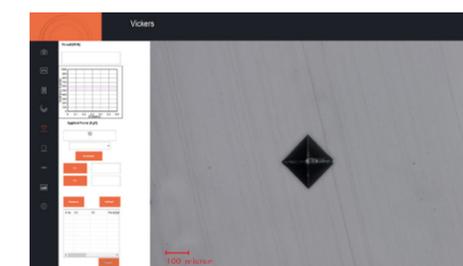
- ◆ Auto Turret to avoid indenter damage
- ◆ User friendly
- ◆ Built-in digital micrometer
- ◆ Counter balanced loading
- ◆ Economical
- ◆ 3rd party Direct Certification (optional)

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or scan the QR code below



Sample Leveler (part no. 823-741)



HARDNESS PRO Measurement Software



C-Mount camera adapter (part no. 823-361)



ALPHA-MHT-1000VK

ALPHA-MHT-1000VK

- Dual Vickers AND Knoop Indenters
- Auto-turret
- Load range 10-1000 grams
- Scales (HV and HK)
- Dwell time 0-95 seconds
- Auto hardness conversion to other scales (HRA, HRB, HRC, HV, HK, HBW, etc)
- Robust and durable design



Dual Vickers and Knoop Indenters with individual 40X (2) objectives



ALPHA-MHT-AUTO

ALPHA-MHT-AUTO

- Automated Microhardness Testing
- Vickers or Knoop Indenters
- Auto-turret
- Load range 10-1000 grams
- Scales (HV, HK)
- Dwell time 0-60 seconds
- Maximum sample height 6.7-inches (170 mm)
- X-Y Anvil travel range 4.3 x 4.3-inches (110 x 110 mm)
- Auto hardness conversion to other scales (HV, HK, HRA, HRBW, HRC, HRD, HREW, HRFW, HRGW, HRKW, HR15N, HR30N, HR45N, HR15TW, HR30TW, HR45TW, HS, HBW)
- Robust and durable design

Microhardness Testers

Model Name	ALPHA-MHT-1000VK	ALPHA-MHT-AUTO
Indenter types	Dual Vickers and Knoop	Vickers or Knoop
Objective Magnification	10X (observation) and 20X & 40X (2)(measurement)	10X and 40X
Indenter Positioning	Auto turret	Automatic (Loading/Dwell/Unloading)
Testing force (gf)	10, 25, 50, 100, 200, 300, 400, 500, 1000	10, 25, 50, 100, 200, 300, 400, 500, 1000
Auto Hardness Conversion	HV, HK, HRA, HRBW, HRC, HRD, HREW, HRFW, HRGW, HRKW, HR15N, HR30N, HR45N, HR15TW, HR30TW, HR45TW, HS, HBW	HV, HK, HRA, HRBW, HRC, HRD, HREW, HRFW, HRGW, HRKW, HR15N, HR30N, HR45N, HR15TW, HR30TW, HR45TW, HS, HBW
Testing Range	1 HV ~ 3000 HV	1 HV ~ 3000 HV
X-Y Anvil Size	4 x 4-inch (100 x 100 mm)	4.3 x 4.3-inch (110 x 110 mm)
X-Y Anvil Travel	1 x 1-inch (25 x 25 mm)	2 x 1-inch (50 x 50 mm)
Dwell Time	0-95 seconds	0-60 seconds
Maximum Sample Height	3.5-inches (90 mm)	6.7-inches (170 mm)
Throat Depth	4-inches (100 mm)	5.1-inches (130 mm)
Illumination	Halogen	Halogen
Dimensions (W x D x H)	17 x 19 x 17-inch (425 x 490 x 425mm)	13.2 x 22 x 26.6-inch (335 x 560 x 675 mm)
Electrical Specifications	110V / 220V 50/60 Hz	110V / 220V 50/60 Hz
Weight	77 lbs (35 kg)	115 lbs (52 kg)
Microhardness indentation measurement software (optional)	HARDNESS PRO	Built-in
C-Mount camera attachment (optional)	823-361	Built-in
Sample leveler (optional)	823-741	823-741
Direct Certification (optional)	3rd Party	3rd Party
Catalog Number	ALPHA-MHT-1000VK	ALPHA-MHT-AUTO

2 year warranty
Limited Warranty

Benefits:

- ◆ Fully automated ALPHA-MHT-AUTO
- ◆ Dual Vickers AND Knoop indenters ALPHA-MHT-1000VK
- ◆ Auto Turret to avoid indenter damage
- ◆ User friendly
- ◆ Built-in digital micrometer
- ◆ Counter balanced loading
- ◆ Economical
- ◆ 3rd party Direct Certification (optional)

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CE EN 61000-1:2010, EN 61000-3-3:2013
2014/35/ EU Low Voltage Directive
2014/30/EU Electromagnetic Compatibility Directive

CONSUMABLES (Microhardness and Rockwell)

Microhardness Test Blocks and Accessories

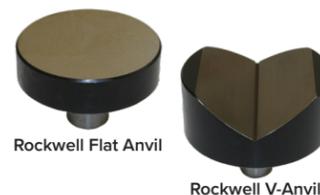
PACE Product Name	Catalog Number	Qty
Vickers (1 gram to 1000 grams) for all microhardness hardness ranges	MV010	each
Knoop (1 gram to 1000 grams) for all microhardness hardness ranges	MK010	each
Vickers microhardness Diamond Penetrator - certified	P1110	each
Knoop microhardness Diamond Penetrator - certified	P1120	each

Rockwell Hardness Test Blocks

PACE Product Name	Catalog Number	Qty
A-Scale, C diamond, 60 kg, A60-A84, Steel Rockwell hardness test block	RA10	each
A-Scale, C diamond, 60 kg, A20-A59, Brass Rockwell hardness test block	RA20	each
A-Scale, A diamond (carbide), 60 kg, A88 & up, Carbide Rockwell hardness test block	RA30	each
B-Scale, 1/16-inch ball, 100 kg, B10-B92, Steel Rockwell hardness test block	RB10	each
B-Scale, 1/16-inch ball, 100 kg, B90-B130, Steel Rockwell hardness test block	RB20	each
C-Scale, C Diamond, 150 kg, All, Steel Rockwell hardness test block	RC10	each
D-Scale, C Diamond, 100 kg, All, Steel Rockwell hardness test block	RD10	each
E-Scale, 1/8-inch ball, 100 kg, All, Brass Rockwell hardness test block	RE10	each
F-Scale, 1/16-inch ball, 60 kg, All, Brass Rockwell hardness test block	RF10	each
G-Scale, 1/16-inch ball, 150 kg, G82-91, Brass Rockwell hardness test block	RG10	each
H-Scale, 1/8-inch ball, 60 kg, All, Brass Rockwell hardness test block	RH10	each
K-Scale, 1/8-inch ball, 150 kg, All, Brass Rockwell hardness test block	RK10	each
L-Scale, 1/4-inch ball, 60 kg, All, Brass Rockwell hardness test block	RL10	each
M-Scale, 1/4-inch ball, 100 kg, All, Brass Rockwell hardness test block	RM10	each
P-Scale, 1/4-inch ball, 150 kg, All, Brass Rockwell hardness test block	RP10	each
R-Scale, 1/2-inch ball, 60 kg, All, Brass Rockwell hardness test block	RR10	each
S-Scale, 1/2-inch ball, 100 kg, All, Brass Rockwell hardness test block	RS10	each
V-Scale, 1/2-inch ball, 150 kg, All, Brass Rockwell hardness test block	RV10	each

Rockwell Anvils

PACE Product Name	Catalog Number	Qty
Pedestal Spot (1/4-inch) Rockwell Anvil	A1010	each
1-1/2-inch Flat Rockwell Anvil	A1020	each
2-1/2-inch Flat Rockwell Anvil	A1030	each
Shallow V Rockwell Anvil	A1040	each
Standard V Rockwell Anvil	A1050	each



Rockwell Ball Penetrators

PACE Product Name	Catalog Number	Qty
1/16-inch Carbide Ball Penetrator Indentron Certified	P20101	each
1/16-inch Carbide Ball, Certified	P20150	each
1/8-inch Carbide Ball Penetrator Indentron Certified	P20201	each
1/8-inch Carbide Ball, Certified	P20250	each
1/4-inch Carbide Ball Penetrator Indentron Certified	P20301	each
1/4-inch Carbide Ball, Certified	P20350	each
1/2-inch Carbide Ball Penetrator Indentron Certified	P20401	each
1/2-inch Carbide Ball, Certified	P20450	each

Superficial Rockwell Hardness Test Blocks

PACE Product Name	Catalog Number	Qty
15 N Scale, N Diamond, 15 kg, All, Steel, Superficial hardness test blocks	S15N10	each
30 N Scale, N Diamond, 30 kg, All, Steel, Superficial hardness test blocks	S30N10	each
45 N Scale, N Diamond, 45 kg, All, Steel, Superficial hardness test blocks	S45N10	each
15 T Scale, 1/16-inch Ball, 15 kg, All, Brass, Superficial hardness test blocks	S15T10	each
30 T Scale, 1/16-inch Ball, 30 kg, All, Brass, Superficial hardness test blocks	S30T10	each
45 T Scale, 1/16-inch Ball, 45 kg, All, Brass, Superficial hardness test blocks	S45T10	each
15 W Scale, 1/8-inch Ball, 15 kg, All, Brass, Superficial hardness test blocks	S15W10	each
30 W Scale, 1/8-inch Ball, 3015 kg, All, Brass, Superficial hardness test blocks	S30W10	each
45 W Scale, 1/8-inch Ball, 45 kg, All, Brass, Superficial hardness test blocks	S45W10	each
15 X Scale, 1/4-inch Ball, 15 kg, All, Brass, Superficial hardness test blocks	S15X10	each
30 X Scale, 1/4-inch Ball, 30 kg, All, Brass, Superficial hardness test blocks	S30X10	each
45 X Scale, 1/4-inch Ball, 45 kg, All, Brass, Superficial hardness test blocks	S45X10	each
15 Y Scale, 1/2-inch Ball, 15 kg, All, Brass, Superficial hardness test blocks	S15Y10	each
30 Y Scale, 1/2-inch Ball, 30 kg, All, Brass, Superficial hardness test blocks	S30Y10	each
45 Y Scale, 1/2-inch Ball, 45 kg, All, Brass, Superficial hardness test blocks	S45Y10	each

ROCKWELL HARDNESS TESTERS

OMEGA-RT2 ROCKWELL TESTER

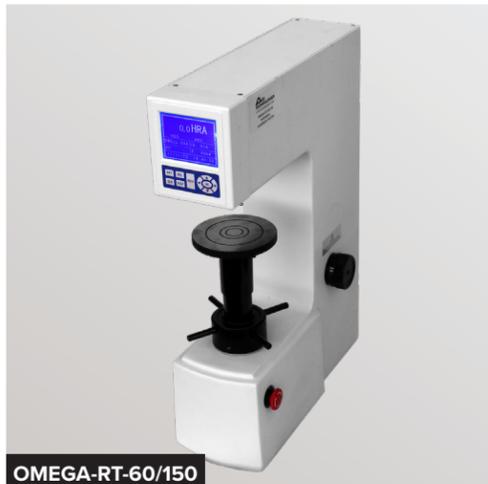


OMEGA-RT2

OMEGA-RT2

- Manual Rockwell Tester
- 60 Kgf, 100 Kgf and 150 Kgf loading
- Analog display
- Robust and durable design
- Manual loading control
- User friendly
- Economical

OMEGA-RT-60/150 ROCKWELL TESTER



OMEGA-RT-60/150

OMEGA-RT-60/150

- Semi-Automated Rockwell Tester
- Initial test force 10 Kgf loading
- Total test force 60, 100 and 150 Kgf loading
- Automatic conversion to 18 different hardness scales
- LCD displays hardness
- Robust and durable design
- Loading time and dwell time (1-60 seconds)
- Auto hardness conversion
- User friendly
- Economical

OMEGA-RST-15/150 ROCKWELL TESTER



OMEGA-RST-15/150

OMEGA-RST-15/150

- Semi-Automated Dual Rockwell / Superficial Tester
- Total test force 15, 30, 45, 60, 100 and 150 Kgf loading
- Automatic conversion to 18 different hardness scales
- LCD displays hardness
- Robust and durable design
- Loading time and dwell time (1-60 seconds)
- Auto hardness conversion
- User friendly
- Economical

Manual Rockwell Hardness Tester

Model Name	OMEGA-RT2
Rockwell Scales	HRA, HRB, HRC
Preliminary test force	10 Kgf (98.07N)
Full test force	60 Kgf, 100 Kgf, 150 Kgf
Loading control	Manual
Instrument Throat Height	6.5-inch (165 mm)
Maximum Sample Height	7.3-inch (185 mm)
Hardness Resolution	0.5 HR
Dimensions (W x D x H)	9.6 x 20.5 x 27.6-inch (245 x 520 x 700mm)
Weight	172 lbs (78 kg)

2 year warranty
Limited Warranty

Benefits:

- ◆ Basic Rockwell Tester
- ◆ Economical
- ◆ Easy to Use

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Semi-Automated Rockwell Hardness Testers

Model Name	OMEGA-RT-60/150	OMEGA-SRT-15/150
Rockwell Tester	Standard Rockwell Tester	Dual Rockwell / Superficial Rockwell Tester
Automation	Semi-Automated	Semi-Automated
Rockwell Scales	HRA, HRD, HRC, HRFW, HRBW, HRGW, HREW, HRKW, HRM, HRP, HRR, HRS, HRV, HR15N, HR30N, HR45N, HR15TW, HR30TW, HR45TW, HR15W, HR30W, HR45W, HR15X, HR30X, HR45X, HR15T, HR30Y, HR45Y	HRA, HRD, HRC, HRFW, HRBW, HRBW, HRGW, HREW, HRKW, HRM, HRP, HRR, HRS, HRV, HR15N, HR30N, HR45N, HR15TW, HR30TW, HR45TW, HR15W, HR30W, HR45W, HR15X, HR30X, HR45X, HR15T, HR30Y, HR45Y
Preliminary test force	10 Kgr (98.07N)	3 Kgr (Superficial) 10 Kgr (Rockwell)
Full test force	60 Kgf, 100 Kgf, 150 Kgf	15, 30, 45, 60, 100, and 150 Kgf
Hardness resolution	0.1 HR	0.1 HR
Dwell time	Adjustable 0-60 seconds	Adjustable 0-60 seconds
Auto Hardness conversion	HV, HK, HRA, HRBW, HRC, HRD, HREW, HRFW, HRGW, HRKW, HR15N, HR30N, HR45N, HR15TW, HR30TW, HR45TW, HS, HBW	HV, HK, HRA, HRBW, HRC, HRD, HREW, HRFW, HRGW, HRKW, HR15N, HR30N, HR45N, HR15TW, HR30TW, HR45TW, HS, HBW
Instrument Throat Height	6.5-inch (165 mm)	6.3-inch (165 mm)
Power	110 or 220V	110 or 220V
Dimensions (W x D x H)	8.5 x 20 x 28 inch (215 x 520 x 700mm)	8.5 x 20 x 28 inch (215 x 520 x 700mm)
Weight	172 lbs (78 kg)	175 lbs (80 Kg)
Direct Certification (optional)	3rd Party	3rd Party

2 year warranty
Limited Warranty

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ROCKWELL HARDNESS TESTERS

OMEGA-RT ROCKWELL TESTER



OMEGA-RT

OMEGA-RT

- Manual Rockwell Tester
- Initial test force 10 Kgf loading
- Total test force 60, 100 and 150 Kgf loading
- Analog display
- Robust and durable design
- Manual loading control
- Easy to use
- Economical

OMEGA-DIGI-RT ROCKWELL TESTER



OMEGA-DIGI-RT

OMEGA-DIGI-RT

- Digital Semi-Automated Rockwell Tester
- Initial test force 10 Kgf loading
- Total test force 60, 100 and 150 Kgf loading
- Automatic conversion to 16 different hardness scales
- Touch screen display
- Robust and durable design
- Loading time and dwell time (1-60 seconds)
- Auto hardness conversion
- User friendly
- Economical

OMEGA-DIGI-RST ROCKWELL TESTER



OMEGA-DIGI-RST

OMEGA-DIGI-RST

- Digital Semi-Automated Dual Rockwell / Superficial Tester
- Total test force 15, 30, 45, 60, 100 and 150 Kgf loading
- Automatic conversion to 16 different hardness scales
- Touch screen display
- Robust and durable design
- Loading time and dwell time (1-60 seconds)
- Auto hardness conversion
- User friendly
- Economical

Manual Rockwell Hardness Tester

Model Name	OMEGA-RT
Rockwell Scales	HRA, HRB,HRC
Preliminary test force	10 Kgf (98.07N)
Full test force	60 Kgf, 100 Kgf, 150 Kgf
Loading control	Manual
Instrument Throat Height	6.5-inch (165 mm)
Dimensions (W x D x H)	7.2 x 21.5 x 29.7 inch (182 x 546 x 755 mm)
Weight	200 lbs (90 kg)

2 year warranty
Limited Warranty

Benefits:

- ◆ Basic Rockwell Tester
- ◆ Economical
- ◆ Easy to Use

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2 year warranty
Limited Warranty

Semi-Automated Rockwell Hardness Testers

Model Name	OMEGA-DIGI-RT	OMEGA-DIGI-RST
Rockwell Tester	Standard Rockwell Tester	Dual Rockwell / Superficial Rockwell Tester
Automation	Semi-Automated	Semi-Automated
Hardness Scales	Rockwell: HRA, HRB,HRC,HRD,HRE, HRF, HRG, HRH, HRK, HRL, HRM, HRR, HRP, HRS,HRV	Rockwell: HRA, HRB,HRC,HRD,HRE, HRF, HRG, HRH, HRK, HRL, HRM, HRR, HRP, HRS,HRV Superficial Rockwell: HR15N,HR30N,HR45N ,HR15T,HR30T,HR45T
Preliminary test force	10 Kgr (98.07N)	3 Kgr (Superficial) 10 Kgr (Rockwell)
Full test force	60 Kgf, 100 Kgf, 150 Kgf	15, 30, 45, 60, 100, and 150 Kgf
Hardness resolution	0.1 HR	0.1 HR
Dwell time	Adjustable 1-60 seconds	Adjustable 1-60 seconds
Auto Hardness conversion	HRC, HV, HBS, HBW, HK, HRA, HRD, HR15N, HR30N, HR45N, HS, HRF, HR15T, HR30T, HR45T, HR15Y, HRB	HRC, HV, HBS, HBW, HK, HRA, HRD, HR15N, HR30N, HR45N, HS, HRF, HR15T, HR30T, HR45T, HR15Y, HRB
Maximum Height of Specimen	6.9-inch (175 mm)	11.0-inch (280 mm)
Power	110 or 220V	110 or 220V
Dimensions (W x D x H)	7 x 21.5 x 30 inches 182 x 546 x 755 mm)	8.8 x 24 x 35 inches 225 x 615 x 885 mm)
Weight	198 lbs (90 Kg)	265 lbs (120 Kg)
Direct Certification (optional)	3rd Party	3rd Party

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METALLOGRAPHIC ROCKWELL HARDNESS TESTERS

AUTOMATED ROCKWELL TESTERS

OMEGA-AUTO-RT HARDNESS TESTER



OMEGA-AUTO-RT

OMEGA-AUTO-RT

- Fully-automated Rockwell Tester
- Initial test force 10 Kgf loading
- Total test force 60, 100 and 150 Kgf loading
- One touch operation
- Auto load change
- Auto lifting
- Auto loading
- Auto measuring
- Auto conversion
- Ability to set upper and lower limits
- Robust and durable design

OMEGA-AUTO-ST HARDNESS TESTER



OMEGA-AUTO-ST

OMEGA-AUTO-ST

- Fully-automated Superficial Rockwell Tester
- Total test force 15 Kgf, 30 Kgf and 45 Kgf loading (Superficial)
- One touch operation
- Auto load change
- Auto lifting
- Auto loading
- Auto measuring
- Auto conversion
- Color touch screen
- Ability to set upper and lower limits
- Robust and durable design

OMEGA-AUTO-RST HARDNESS TESTER



OMEGA-AUTO-RST

OMEGA-AUTO-RST

- Fully-automated Dual Rockwell / Superficial Rockwell Tester
- 15 Kgf, 30 Kgf and 45 Kgf loading (Superficial)
60 Kgf, 100 Kgf and 150 Kgf loading (Rockwell)
- One touch operation
- Auto load change
- Auto lifting
- Auto loading
- Auto measuring
- Auto conversion
- Color touch screen
- Ability to set upper and lower limits
- Robust and durable design

Automated Rockwell Hardness Testers

Model Name	OMEGA-AUTO-RT	OMEGA-AUTO-ST	OMEGA-AUTO-RST
Rockwell Type	Rockwell	Superficial Rockwell	Dual Rockwell / Superficial Rockwell
Rockwell Scales	HRA, HRB, HRC, HRD, HRE, HRF, HRG, HRH, HRK, HRL, HRM, HRR, HRP, HRS, HRV	HRA, HRB, HRC, HRD, HRE, HRF, HRG, HRH, HRK, HRL, HRM, HRR, HRP, HRS, HRV	HRA, HRB, HRC, HRD, HRE, HRF, HRG, HRH, HRK, HRL, HRM, HRR, HRP, HRS, HRV
Preliminary Test Force	10 Kgr (Rockwell)	3 Kgr (Superficial)	3 Kgr (Superficial) 10 Kgr (Rockwell)
Full Test Force	60 Kgf, 100 Kgf, 150 Kgf (Rockwell)	15 Kgf, 30 Kgf, 45 Kgf (Superficial)	15 Kgf, 30 Kgf, 45 Kgf (Superficial) 60 Kgf, 100 Kgf, 150 Kgf (Rockwell)
Hardness resolution	0.1 HR	0.1 HR	0.1 HR
Dwell Time	Adjustable 1-60 seconds	Adjustable 1-60 seconds	Adjustable 1-60 seconds
Auto Hardness conversion	HRC, HV, HBS, HBW, HK, HRA, HRD, HR15N, HR30N, HR45N, HS, HRF, HR15T, HR30T, HR45T, HRB	HRC, HV, HBS, HBW, HK, HRA, HRD, HR15N, HR30N, HR45N, HS, HRF, HR15T, HR30T, HR45T, HRB	HRC, HV, HBS, HBW, HK, HRA, HRD, HR15N, HR30N, HR45N, HS, HRF, HR15T, HR30T, HR45T, HRB
Max Height of Specimen	11 inches (280 mm)	11 inches (280 mm)	11 inches (280 mm)
Power	110 or 220V	110 or 220V	110 or 220V
Dimensions (W x D x H)	9 x 24 x 34.8 inches (225 x 615 x 885 mm)	9 x 24 x 34.8 inches (225 x 615 x 885 mm)	9 x 24 x 34.8 inches (225 x 615 x 885 mm)
Weight	275.6 lbs (125 Kg)	275.6 lbs (125 Kg)	275.6 lbs (125 Kg)
Direct Certification (optional)	3rd Party	3rd Party	3rd Party
Catalog Number	OMEGA-AUTO-RT	OMEGA-AUTO-ST	OMEGA-AUTO-RST

2 year warranty
Limited Warranty

Benefits:

- ◆ Automated Testers
- ◆ One touch operation
- ◆ Stores up to 2000 single test measurements
- ◆ Stores 1000 groups of test results
- ◆ Eliminates user error for more reproducible results

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METALLOGRAPHIC AUTOMATED ROCKWELL HARDNESS TESTERS



OMEGA-HB

OMEGA-HB

- Manual Brinell Tester
- Test Forces 62.5, 100, 125, 187.5, 250, 500, 750, 1000, 1500 and 3000 Kgf
- Test range (~3.2 to 650 HBW)
- User friendly
- Robust and durable design



OMEGA-HB-3000

OMEGA-HB-3000

- Digital Brinell Tester with Built-In Optics
- Semi-automated
- Built-in eyepiece filar
- Test Forces 62.5, 100, 125, 187.5, 250, 500, 750, 1000, 1500 and 3000 Kgf
- Test range (~3.2 to 650 HBW)
- LCD display
- User friendly
- Robust and durable design



OMEGA-AUTO-HB

OMEGA-AUTO-HB

- Fully-automated BRINELL Tester
- Testing range of ~3.2 to 650 HBW
- One key operation
- Displays data statistics, hardness conversion, and limitation setting
- Loading by high accuracy force sensor
- Compensation of force loss during loading with micro central processing unit
- Test forces 62.5, 100, 125, 187.5, 250, 500, 750, 1000, 500, 3000 Kgf
- Robust and durable design

Brinell Hardness Testers

2 year warranty
Limited Warranty

Model Name	OMEGA-HB	OMEGA-HB-3000	OMEGA-AUTO-HB
Brinell Tester	Manual	Semi-Automated	Automated
Optical Measurement	Manual 20X Optical Scope	Built-in 20X eyepiece filar	Built-in 20X eyepiece filar
Test forces (Kgf)	62.5, 100, 125, 187.5, 250, 500, 750, 1000, 1500, 3000	62.5, 100, 125, 187.5, 250, 500, 750, 1000, 1500, 3000	62.5, 100, 125, 187.5, 250, 500, 750, 1000, 1500, 3000
Testing range	~3.2 to 650 HBW	~3.2 to 650 HBW	~3.2 to 650 HBW
Max. height of specimen	8.1-inch (205 mm)	8.8-inch (225 mm)	10 inches (260 mm)
Max. throat depth	5.3-inch (135 mm)	5.3-inch (135 mm)	6 inches (150 mm)
Power	110 or 220V	110 or 220V	110 or 220V
Dimensions (W x H x D)	9.3 x 21.5 x 29.7-inch (235 x 545 x 755 mm)	9.3 x 21.5 x 31.1-inch (235 x 545 x 790 mm)	12 x 24.5 x 39-inch (313 x 622 x 992 mm)
Weight	290 lbs (130 kg)	290 lbs (130 kg)	375 lbs (170 kg)
Catalog Number	OMEGA-HB	OMEGA-HB-3000	OMEGA-AUTO-HB

Brinell Consumable Test Blocks

PACE Product Name	Catalog Number	Qty
3000 kg load, 10 mm ball Brinell test block for all hardness ranges	B3000	each
2000 kg load, 10 mm ball Brinell test block for all hardness ranges	B2000	each
1500 kg load, 10 mm ball Brinell test block for all hardness ranges	B1500	each
1000 kg load, 10 mm ball Brinell test block for all hardness ranges	B1000	each
500 kg load, 10 mm ball Brinell test block for all hardness ranges	B0500	each
250 kg load, 10 mm ball Brinell test block for all hardness ranges	B0250	each
187.5 kg load, 10 mm ball Brinell test block for all hardness ranges	B0187	each

Brinell Indenters / Carbide Balls

PACE Product Name	Catalog Number	Qty
2.5 mm Brinell carbide balls (each) - certified	P3032	each
5 mm Brinell carbide balls (each) - certified	P3031	each
10 mm Brinell carbide balls (each) - certified	P3020	each
2.5 mm Brinell Indenter with carbide ball - certified	P3132	each
5 mm Brinell Indenter with carbide ball - certified	P3131	each
10 mm Brinell Indenter with carbide ball - certified	P3134	each

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MACRO VICKERS TESTERS

OMEGA Macro Vickers Hardness Testers



OMEGA-5000-VZ

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OMEGA-5000-VZ

- Semi-automated Macro Vickers Tester
- 1, 2, 2.5, 3, 5, 10, 20, 30 and 50 Kgf loading
- 10X and 20X objectives
- Touch screen control
- Auto turret
- Auto focusing
- Auto measurement
- Robust and durable design

2 year warranty
Limited Warranty

Model Name	OMEGA-5000-VZ
Test forces	1kgf, 2kgf, 2.5kgf, 3kgf, 5kgf, 10kgf, 20kgf, 30kgf, 50kgf
Eyepieces	10X
Objectives	10X, 20X
Total Magnification	100X, 200X
Loading Method	Automatic (Loading/Dwell/Unloading)
Dwell time	Adjustable 5-60 seconds
Shifting between Objective and Indenter	Automatic Shifting
Resolution	0.25µm / 0.125µm
Illumination	Halogen
Maximum Sample Height	6.7-inch (170 mm)
Power	110 or 220V
Dimensions (W x H x D)	11 x 21 x 25 inch (280 x 530 x 630mm)
Weight	77 lbs (35 kg)
Part No.	OMEGA-5000-VZ

Macro Vickers Test Blocks

PACE Product Name	Catalog Number	Qty
Heavy Load Vickers (1 kg to 50 kg)	MV020	each

Steel Hardness Conversion Table:

This table compares the relative tensile strength to the approximate hardness of steel for the Brinell, Rockwell B, Rockwell C and Vickers scales.

Brinell Hardness (HB)	Rockwell (HRC)	Rockwell (HRB)	Vickers (VZ)	Tensile Strength (N/mm ²)
3000 kg 10 mm Ball	150 kg Diamond	100 kg 1/16-inch Ball	Diamond 120 kg	Approx.
800	72			
745	68			
695	64			
641	61			
592	57		727	
552	55		649	
504	52	118	549	
456	48	116	490	1569
402	43	114	424	1390
348	38	110	361	1187
300	32	107	303	1020
255	26	102	258	870
203	16	94	201	680
154	1	82	152	515
105		62	112	378

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IM-3000B Microscope

IM-3000B Microscope

Inverted Metallurgical Microscope

- Basic Metallographic Microscope
 - Brightfield Illumination
 - Polarized Light Illumination
- 5 position turret for 5X, 10X, 20X, 50X and 100X Infinite Plan Achromatic Objectives
- Dual widefield eyepieces
- Mechanical X-Y stage control
- Bright Halogen Light Source
- Multiple camera ports
- Robust and durable design
- Economical Basic Metallurgical Microscope



IM-3000B Infinite Plan Achromatic Objectives



IM-5000 Microscope

IM-5000 Microscope

Inverted Metallurgical Microscope

- Powerful Metallographic Microscope
 - Brightfield Illumination
 - Darkfield Illumination
 - Polarized Light
 - Differential Interference Contrast (DIC) Illumination
- 5 position turret for 5X, 10X, 20X, 50X and 100X DIC Objectives
- Dual widefield eyepieces
- Mechanical X-Y stage control
- Bright Halogen Light Source
- Multiple camera ports
- Robust and durable design
- Economical High Performance Metallurgical Microscope



IM-5000 Objectives

IM-3000B Brightfield Metallographic Microscope

Model Name	IM-3000B
Illumination Techniques	Brightfield and Polarized Light
Objectives:	Infinite Plan Achromatic 5X/0.12 Infinite Plan Achromatic 10X/0.25 Infinite Plan Achromatic 20X/0.40 Infinite Plan Achromatic 50X/0.80 Infinite Plan Achromatic 100X/0.90
Eyepiece:	Wide field WF 10X (field no. 22 mm)
Trinocular Head:	Trinocular, 45 degree inclination ratio Observation: 80%, photo 20%
Focusing System:	Coaxial coarse/fine focus (2 micron) Travel (stage to focal plane) up 1 mm, down 7 mm
Nosepiece:	Quintuple
Mechanical Stage:	X-Y stage Travel range: 1.6 x 1.6-inches (40 x 40 mm) Size: 8.9 x 7-inch (226 x 178 mm)
Illumination:	12V/50W Halogen Lamp
Color Filters:	Grey, Blue, Green color filters & ground glass
Electrical Specification	110V/220V (50/60 Hz) (single phase)
Additional Accessories	Digital Cameras: 3.1 MP (CAM-31) / 9 MP (CAM-91)
Catalog Number	IM-3000B

2 year warranty
Limited Warranty

Benefits:

- ◆ Brightfield illumination
- ◆ Polarized light illumination
- ◆ X-Y Stage control
- ◆ Multiple camera ports

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IM-5000 Brightfield, Darkfield & DIC Microscope

Model Name	IM-5000
Illumination Techniques	Brightfield, Darkfield, Polarized Light & Differential Interference contrast (DIC)
Objectives:	PL L5X/0.12 BD (working distance 10 mm) PL L10X/0.25 BD (working distance 10 mm) PL L20/0.40 BD (working distance 5 mm) PL L50X/0.70 BD (working distance 1.3 mm) PL L100X/0.90 BD (working distance 0.7 mm)
Eyepiece:	Wide field WF 10X (field no. 22 mm)
Trinocular Head:	Trinocular, 45 degree inclination ratio Observation: 80%, photo 20%
Focusing System:	Coaxial coarse/fine focus (2 micron) Travel (stage to focal plane) up 1 mm, down 7 mm
Nosepiece:	Quintuple
Mechanical Stage:	X-Y stage Travel range: 1.6 x 1.6-inches (40 x 40 mm) Size: 8.9 x 7-inch (226 x 178 mm)
Illumination:	12V/50W Halogen Lamp
Color Filters:	Grey, Blue, Green color filters & ground glass
Electrical Specification	110V/220V (50/60 Hz) (single phase)
Additional Accessories	Digital Cameras: 3.1 MP (CAM-31) / 9 MP (CAM-91)
Catalog Number	IM-5000

2 year warranty
Limited Warranty

Benefits:

- ◆ Brightfield illumination
- ◆ Darkfield illumination
- ◆ Polarized light illumination
- ◆ Differential interference contrast
- ◆ X-Y Stage control
- ◆ Multiple camera ports

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IM-7000 Microscope

IM-7000 Microscope

Premium Inverted Metallurgical Microscope

- Powerful Metallurgical Microscope
 - Brightfield Illumination
 - Darkfield Illumination
 - Polarized Light
 - Differential Interference Contrast (DIC) Illumination
- 5 position turret for 5X, 10X, 20X, 50X and 100X DIC Objectives with long working distance
- Dual 30 mm diameter, ultra-wide field (10X/22mm) eyepieces
- Mechanical X-Y stage control
- Bright LED Light Source
- Standard C-mount camera ports
- Robust and durable design
- Higher Performance Metallurgical Microscope
- LM Plan S-APO objectives are premium, long-working-distance, super-apochromatic, plan-corrected lenses for metallurgical reflected-light microscopy which offers the best combination of working distance, resolution, and chromatic fidelity available
- Long working distance objectives improve imaging of coatings and uneven samples due to polishing relief
- Excellent color and contrast, making it ideal for digital imaging and quantitative color analysis

Objective Designations

- ◆ LM-Long-Working-Distance: Designed for reflected-light metallurgical microscopes, providing extended working distance for surface examination.
- ◆ Plan-Planar Field Correction: Ensures a flat, distortion-free image across the entire field of view.
- ◆ S-Apo Super-Apochromat: Offers the highest level of color and spherical aberration correction across the visible spectrum.



Control Panel & Display



IM-7000 Infinity-corrected, long-working-distance, plan-corrected, super-apochromatic objectives

IM-7000 Brightfield, Darkfield, Polarized & DIC Microscope

Model Name	IM-7000
Illumination Techniques	Brightfield, Darkfield, Polarized Light & Differential Interference contrast (DIC)
Objectives	Infinity-corrected, long-working-distance, plan-corrected, super-apochromatic objectives LM Plan S-APO 5X/0.15/WD 14.4 mm LM Plan S-APO 10X/0.30/WD 12.1 mm LM Plan S-APO 20X/0.45/WD 11.1 mm LM Plan S-APO 50X/0.75/WD 3.65 mm LM Plan S-APO 100X/0.80/WD 3.2 mm
Eyepieces	Plan wide field WF 10X (field no. 22 mm)
Trinocular Head	• 30° inclined high-grade trinocular head, 360° rotatable • 0/100 and 50/50 light split options • Adjustable interpupillary distance: 45–76 mm adjustable diopter for both eyes
Focusing System	• Coaxial coarse and fine focusing, available for both hands • Fine focus precision: 1 µm (0.001 mm) • Fine focus travel per revolution: 0.1 mm • Coarse focus travel per revolution: 34 mm • Total focusing range: 9 mm • Equipped with tension adjustment and anti-collision height limit
Nosepiece	Quintuple
Mechanical Stage	• Stage dimensions: 235 mm × 178 mm • Travel range: 50 mm × 50 mm • Smooth, precise movement with minimal surface irregularity • Pre-set steel wire tension for comfortable and accurate control • Low-position control knobs to reduce fatigue
Illumination	• Köhler illumination • Built-in high-brightness, long-lifetime white LED chip • High color rendering index, constant color temperature (4500K) • 10W LED output equivalent to 100W halogen lamp • LED lifetime ≥ 60,000 hours
Body Construction	High-quality aluminum alloy, one-piece die-cast, full-metal streamlined body. Built-in inclined five-hole nosepiece.
Electrical Specification	110V/220V (50/60 Hz) Single Phase
Additional Accessories	Digital Cameras: 3.1 MP (CAM-31) / 9 MP (CAM-91)
Catalog Number	IM-7000

2 year warranty
Limited Warranty

Benefits:

- ◆ Brightfield illumination
- ◆ Darkfield illumination
- ◆ Polarized light illumination
- ◆ Differential interference contrast
- ◆ X-Y Stage control
- ◆ LED illumination (4500K)
- ◆ Long working distance objectives

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IM-7000 Inverted microscope for material analysis with brightfield, darkfield, polarized, and DIC capabilities



DIC Normaski Prism for enhanced visualization of fine surface details in material samples



ZMSO745T Microscope

ZMSO745T Stereo Microscope

- Stereo imaging for better 3-dimensional viewing (excellent for weld analysis)
- Dual eyepieces
- 10X zoom
- High depth of focus
- X-Y stage (optional)
- Trinocular head for camera attachment
- Robust and durable design
- Economical Stereographic Metallurgical Microscope



VM-100 Microscope

VM-100 Digital Stereo Microscope

- Digital High Resolution Stereo Microscope
- Photo and video recording capability
- Built-in zoom
- Unit includes monitor
- Adjustable bottom and top LED illumination
- Robust and durable design



VM-500-PLUS Microscope

VM-500-PLUS Digital Stereo Microscope

- Digital High Resolution Stereo Microscope
- Auto Focus
- Photo and video recording capability
- Built-in zoom
- Unit includes monitor
- Adjustable bottom and top LED illumination
- Includes built-in measuring software
- Robust and durable design

ZMSO745T Stereo Metallographic Microscope

2 year warranty
Limited Warranty

Model Name	ZMSO745T	ACCESSORIES	CATALOG NUMBER
Illumination Techniques	Oblique Illumination	Eyepieces: SWH10X/23mm SWH15X/17mm SWH20X/14mm	416-101 416-151 416-201
Total Magnification	7-45X (with 10X eyepieces)	Magnifiers: 0.37X magnifying objective 0.5X magnifying objective 0.7X magnifying objective 1.5X magnifying objective 2X magnifying objective	416-311 416-321 416-331 416-341 416-351
Eyepiece Options	10X (standard), 15X and/or 20X (optional)	Digital camera	CAM-31 or CAM-91
Trinocular Head	Inclined 45 degrees from main body (360 degree rotation)	1X CCD adapter	417-101
Diopter Adjustment	+/- 6 degrees	4-Division LED Lightsource (ML-144D)	413-136
Interpupillary Adjustment	2 ~ 3-inch (52 ~ 76 mm)	Fiber optic light source (150 W)	413-227
Focus Range	3-inch (76 mm)	Mechanical stage with X-Y micrometers	419-162
Stage Size	5-inch (125 mm)		
Color Filters:	Grey, Blue, Green color filters & ground glass		
Catalog Number	ZMSO745T		

VM Digital Stereo Metallographic Microscope

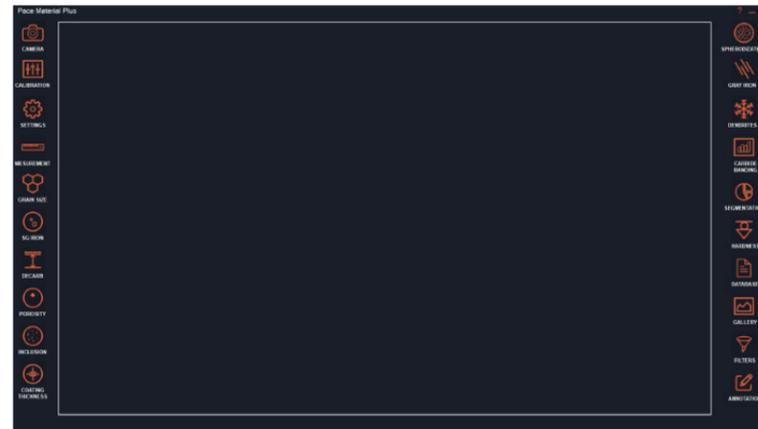
2 year warranty
Limited Warranty

Model Name	VM-100	VM-500-PLUS
Illumination Techniques	Oblique Illumination	Oblique Illumination with Auto Focus
Optical Objective	0.7 X ~ 4.5X Horizontal zoom lens (Zoom ratio: 6.5:1)	0.7 X ~ 4.5X Horizontal zoom lens (Zoom ratio: 6.5:1)
Camera Parameter	2 million pixel (1920 x 1080) Image size: 1/2.86-inch Frames per second: 30 fps	2 million pixel (1920 x 1080) Image size: 1/2.86-inch Frames per second: 1080P@60 fps
Camera Function	<ul style="list-style-type: none"> • White balance, brightness control, digital noise reduction • Photograph and video recording • VGA/USB Out put, SD card storage • Cross hairline, Picture frozen, 10 X digital magnification 	<ul style="list-style-type: none"> • White balance, brightness control, digital noise reduction • Photograph and video recording • VGA/USB Out put, • Cross hairline, Picture frozen, 10 X digital magnification
Measuring Function	Optional PC System and measuring software can measure image in field of view	Linear dimensions such as distance, perimeter, area, angle, radian, width, height, and radius elements are measured
Interpupillary Adjustment	2 ~ 3-inch (52 ~ 76 mm)	
Microscope Stand	Z-axis Travel: 6-inch (150 mm), Coarse/fine lifting system	Z-axis Travel: 4-inch (100 mm), Coarse/fine lifting system
Electrical Parameters	90~240 V; 50~60 Hz	90~240 V; 50~60 Hz
Dimensions (W x D x H)	11.4 x 11 x 15.7 inches (290 x 280 x 400 mm)	14.8 x 11.2 x 19.7 inches (375 x 285 x 500 mm)
Weight	10 lbs (4.7 kg)	14 lbs (6.5 kg)
Catalog Number	VM-100	VM-500-PLUS

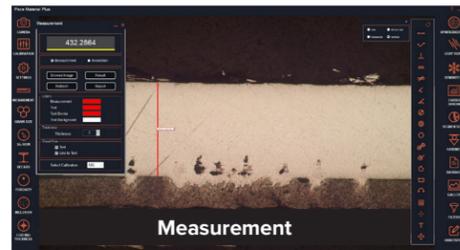
CE EN 61000-1:2010, EN 61000-3-3:2013
2014/35/ EU Low Voltage Directive
2014/30/EU Electromagnetic Compatibility Directive

MATERIALS PLUS

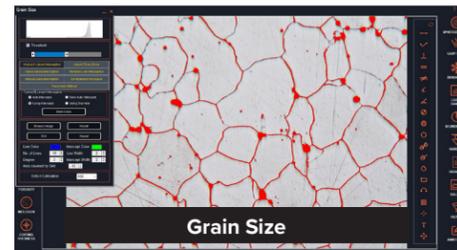
- Metallographic Image Analysis Modules
- Basic Measurements
- Grain Size
- Gray Iron
- Spheroidal or Ductile Gray Iron
- Carbide
- Porosity
- Inclusion Rating
- Coating Thickness
- Spheroidization
- Decarburization
- Segmentation
- DAS - Dendritic Spacing
- Stitching



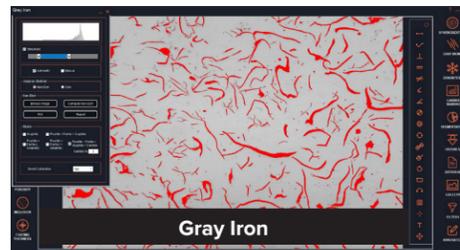
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Measurement



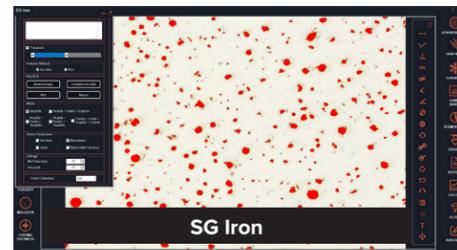
Grain Size



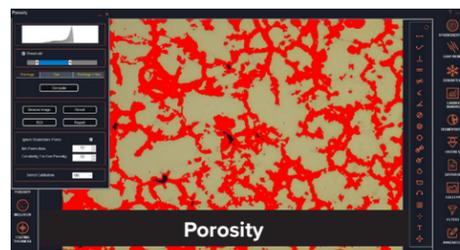
Gray Iron



Inclusion Rating



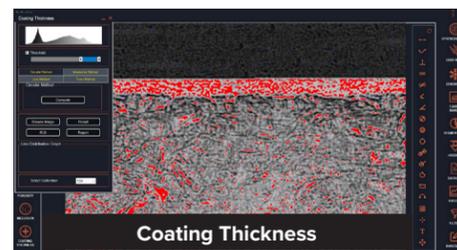
SG Iron



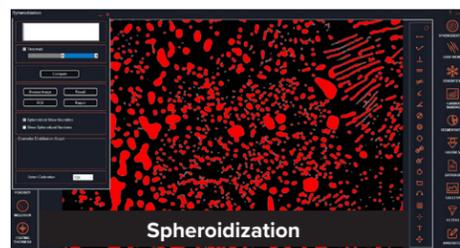
Porosity



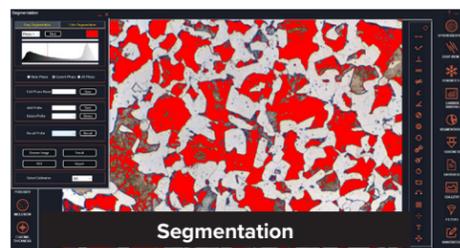
Carbide Banding



Coating Thickness



Spheroidization



Segmentation



Dendrite Arm Spacing

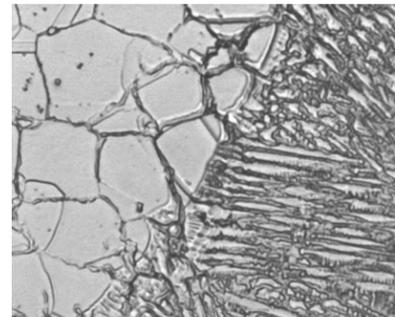
Measurement Modules

MODULE	MEASUREMENT	MEASUREMENT BASIS	ICON / web link
Measurement	Manually draw lines on traces, shapes	Straight length, angle, curved length, width, area, radius, perimeter, area by keyboard	 MEASUREMENT
Grain Size	Heyn lineal intercept procedure, Abrams Three-Circle Procedure, Random Line Intersection Methods, Jeffries Planimetric Method, Comparison Procedure Method	ASTM E112	 GRAIN SIZE
Gray Iron	Graphite flakes are described by the type and distribution of graphite in cast iron with the following three classifications: Type VII for graphite form, A-E distribution of graphite and graphite size (1-largest to 8-smallest)	ASTM A-247	 GRAY IRON
SG Iron	Nodularity describes the type and distribution of graphite in cast iron with the following three classifications: Types I-VI for graphite form, A-E distribution of graphite and graphite size (1-largest to 8-smallest)	ASTM A-247-67	 SG IRON
Carbide Banding	Estimates the amount of iron carbide or cementation in steels and cast irons. Carbide is measured as a volume fraction	ASTM E562 & E1245	 CARBIDE
Porosity	Porosity are voids in the material caused by entrapped air and incomplete or poor sintering. Porosity can be measured as a volume fraction	ASTM E562 & E1245	 POROSITY
Inclusion	Characterizes the type, size and severity of the inclusion in wrought steel. The types include: SULFIDE (A TYPE), ALUMINA (B TYPE) SILICATE (C TYPE), GLOBULAR (D TYPE). Size is characterized as H-heavy or T-thin. Severity Level is based on the number or length	ASTM E45	 INCLUSION
Coating Thickness	Measures a coating thickness after cross sectioning the specimen	ASTM B487	 COATING THICKNESS
Spheroidization	Nodules acquire blue color and non-nodules are set to a red color. Nodules are designated by Roman numbers from I to VI and by size using Arabic numbers 1 to 8. The results are reported along with the calculated nodules/sq mm	ASTM A892	 SPHERODIZATION
Decarburization	Decarburization is the loss of carbon at the metal surface due to chemical reaction(s) with the contacting media. The analysis estimates the average or greatest depth of decarburization in hardened or non-hardened steel products	ASTM E1077	 DECARBURIZATION
Segmentation or Phase Analysis	Phases are defined as physically homogenous and distinct constituents of the material. The phases are partitioned or segmented based on the intensity / gray scale of the various constituents and are characterized and measured using area or volume fraction measurements	ASTM E562 & E1245	 SEGMENTATION
DAS (Dendrites)	Dendritic Arm Spacing (DAS) measures the mean spacing, minimum and maximum spacing as well as the standard distribution.		 DENDRITES
Stitching	Stitching is the process of combining multiple images together for higher magnification analysis over a larger area. For example, this would be very useful for analyzing the thickness of a thin coating over a larger range.		 STITCHER

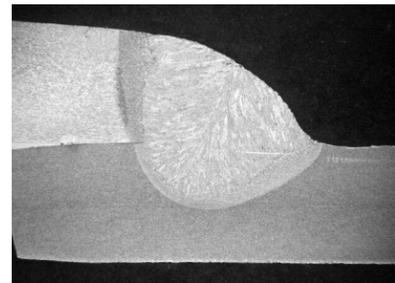
WELD CHECK

- Welding Features
- Leg Lengths
- Depth of Penetration
- Throat Height
- Root size
- Angle measurements
- Plate thickness and % weld penetration
- Toe undercut
- Face and Root reinforcement thickness

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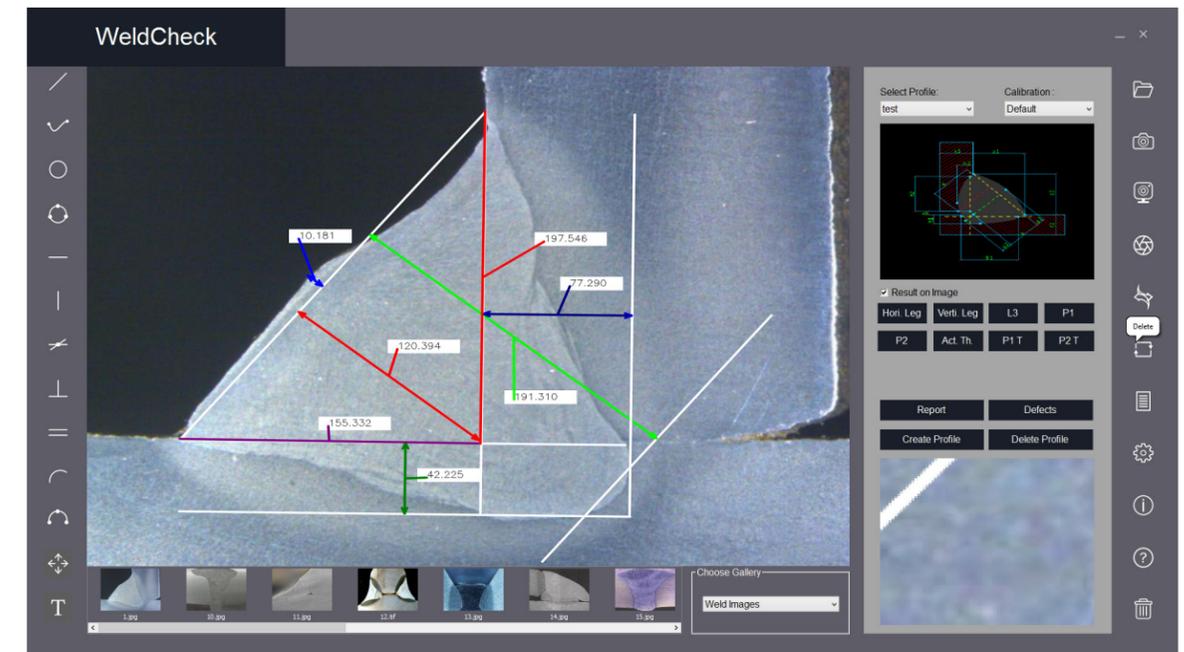


Inconel 625 Weld, 500X (B.F.),
INCONEL Etch for a few seconds



Plain Carbon Steel Weld, 50X (B.F.),
2% Nital for a few seconds

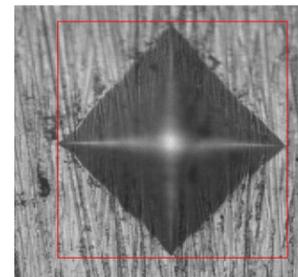
WELD CHECK Measurement Module



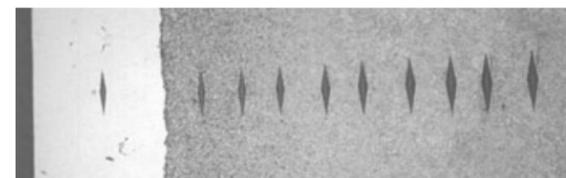
HARDNESS PRO

- Automatic or Interactive measurement of Vickers, Knoop and Brinell Indents
- Manual measurement on live image or acquired image
- Automated calculation of the best circumference minimizes the average quadratic error
- Image acquisition in high resolution 64-bit Colors
- In the event, that the automatic measurement fails, the program offers the possibility to manually measure through the acquisition of three points in Brinell, D1 and D2 in Vickers and Simple L in Knoop
- Accuracy up to 0.001 μm
- Multi-field analysis
- Case Hardness depth (CHD) measurement is automatic

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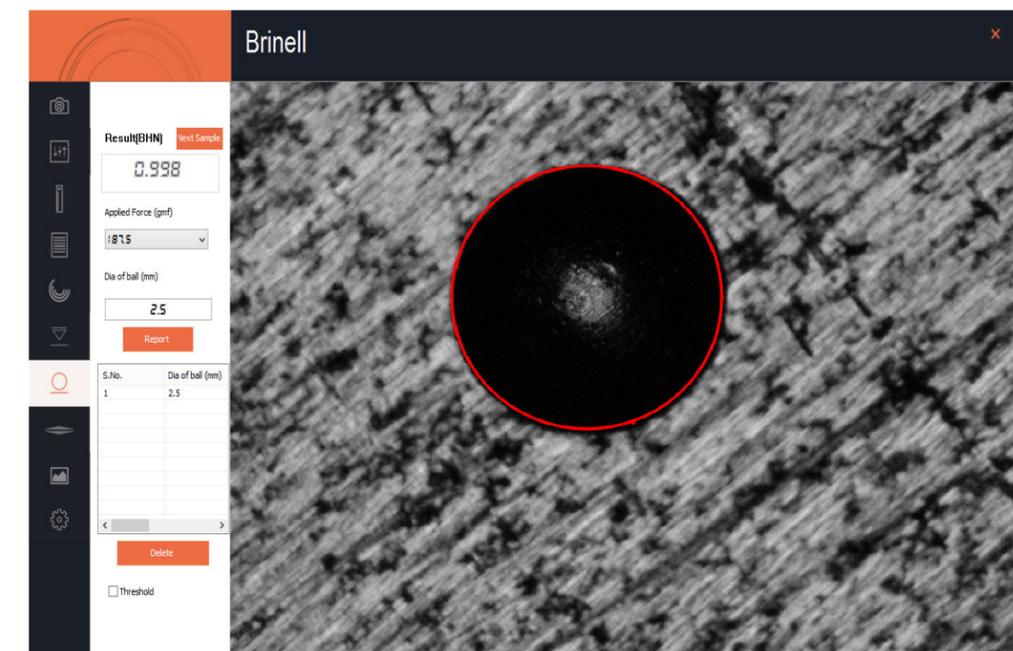


Vickers indent



Knoop Indent

HARDNESS PRO Measurement Module





SPEC-STORE

SPEC-STORE

- Removable and interchangeable trays so the user can design the cabinet's interior to their personalized needs
- Trays store 1-inch, 1.25-inch, 1.5 inch or 2-inch diameter specimens (sold separately)
- User can remove trays from a drawer to store polishing pads if desired
- Robust and durable design



CAB-C

CAB-F

SAFETY CABINETS

- Heavy Duty Steel Cabinets
- Yellow Ventilated Flammable Cabinet
- Blue Ventilated Chemical Cabinet
- Corrosion resistant shelves
- Robust and durable design



FUME-HOOD

FUME HOOD

- Digital feedback speed control
- LED speed display
- Easy to use
- Flexible
- Ideal for all materials
- User friendly
- Easy service access
- Sink with water tap
- Built-in plumbing for air/gas
- Large storage cabinet
- Built-in 110 VAC outlets
- Robust and durable design

Specimen Storage Cabinet

Model Name	SPEC-STORE
Cabinet	Specimen Storage
Drawers / Shelves	10 stainless steel drawers
Specimen spacer trays (2 per drawer)	1-inch and 25 mm - 50 mounts/tray 1.25-inch and 30 mm - 45 mounts/tray 1.5-inch - 28 mounts/tray 40 mm - 28 mounts/tray 2-inch and 50 mm - 18 mounts/tray
Dimensions (WxDxH)	21.75 x 18 x 27-inches (552 x 470 x 686 mm)
Weight	100 lbs (46 kgs)
Catalog Number	SPEC-STORE

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Safety Storage Cabinets

Model Name	CAB-C (Chemical)	CAB-F (Flammable)
Dimensions (WxDxH)	43 x 18 x 44-inches (1092 x 457 x 1118 mm)	43 x 18 x 65-inches (1092 x 457 x 1651 mm)
Weight	220 lbs (100 kg)	304 lbs (140 kg)
Color	Blue	Yellow
Catalog Number	CAB-C	CAB-F

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Fume Hood

Model Name	FUME-HOOD
Overall Dimensions (WxDxH)	47.2 x 32 x 118-inches (1200 x 810 x 3000 mm)
Chamber Dimensions (WxDxH)	37 x 26 x 47-inches (940 x 660 x 1200 mm)
Sink Dimensions (WxDxH)	4.25 x 8.75 x 4.75-inches (120 x 220 x 120 mm)
Electrical Specification	110V
Weight	540 lbs (245 kg)
Catalog Number	FUME-HOOD

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MEGA-BENCH

MEGA-BENCH

- One drawer and double door cabinet
- Can support up to 661 lbs (300 kgs)
- Engineered to support the MEGA bench top abrasive cutters
- Optional replaceable protective bench cover available
- Robust and durable design



BENCHES

LAB EQUIPMENT BENCHES

- Designed to fit with one another or stand-alone
- Double door cabinets and single drawer on the S-Benches and D-Benches, one cabinet on the C-bench
- Supports up to 661 lbs (300 kgs)
- Optional replaceable protective bench covers and back panels available
- Robust and durable design



MBENCHES

MICROSCOPE BENCHES

- Excellent for microscopes and microhardness testers
- Designed to include chair access
- Optional replaceable protective bench covers and back panels available
- Robust and durable design



WALL-CAB

Wall Cabinets

- Excellent for storage of metallographic consumables
- Robust and durable design

MEGA Abrasive Cutter Benches

Model Name	MEGA-T2-BENCH	MEGA-T3-BENCH
Cabinet	Short Bench for MEGA Abrasive Cutters	Short Bench for MEGA Abrasive Cutters
Dimensions (W x D x H)	39 x 29.5 x 33.5 in (991 x 749 x 851 mm)	39 x 36 x 33.5 in (991 x 914 x 851 mm)
Weight	138 lb (62.5 kg)	145 lb (66 kg)
Catalog Number	MEGA-T2-BENCH	MEGA-T3-BENCH

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Laboratory Equipment Benches

Model Name	S-BENCH	D-BENCH	C-BENCH
Cabinet	Short Equipment Bench	Long Equipment Bench	Corner Bench
Dimensions (WxDxH)	39.25 x 29.5 x 33.5 in (997 x 749 x 851 mm)	78.75 x 29.5 x 33.5 in (2000 x 749 x 851 mm)	55.5 x 48.75 x 33.5 in (1388 x 1238 x 851 mm)
Weight	153 lbs (70 kg)	297 lbs (135 kg)	120 lbs (55 kg)
Catalog Number	S-BENCH	D-BENCH	C-BENCH

Microscope Benches

Model Name	S-MBENCH	D-MBENCH
Cabinet	Short Microscope Bench	Long Microscope Bench
Dimensions (WxDxH)	78 x 29.5 x 33.5 -inches (2000 x 749 x 851 mm)	103 x 29.5 x 33.5-inches (2610 x 749 x 851 mm)
Weight	153 lbs (70 kg)	337 lbs (153 kg)
Catalog Number	S-MBENCH	D-MBENCH

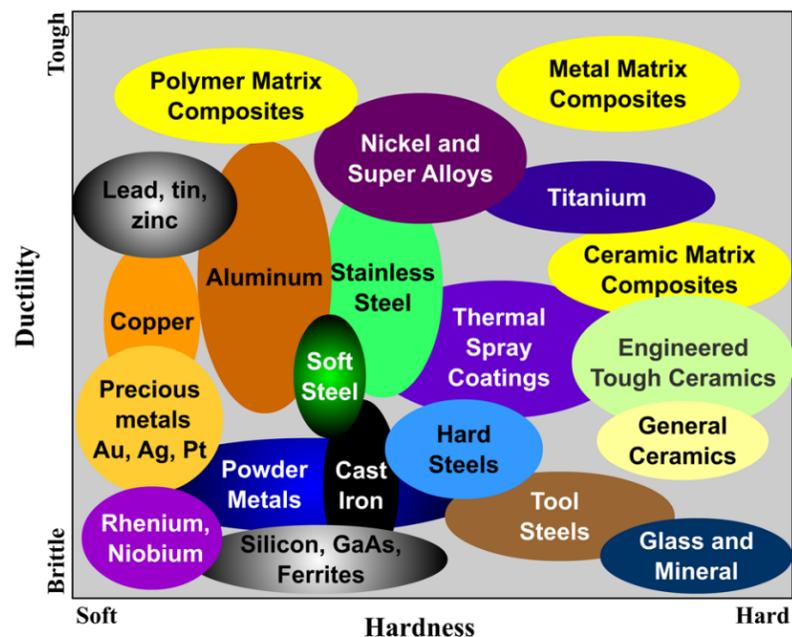
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Wall Cabinets

Model Name	WAL-CAB
Dimensions (WxDxH)	35 x 12 x 24-inches (900 x 300 x 600 mm)
Weight	55 lbs (25 kg)
Catalog Number	WAL-CAB

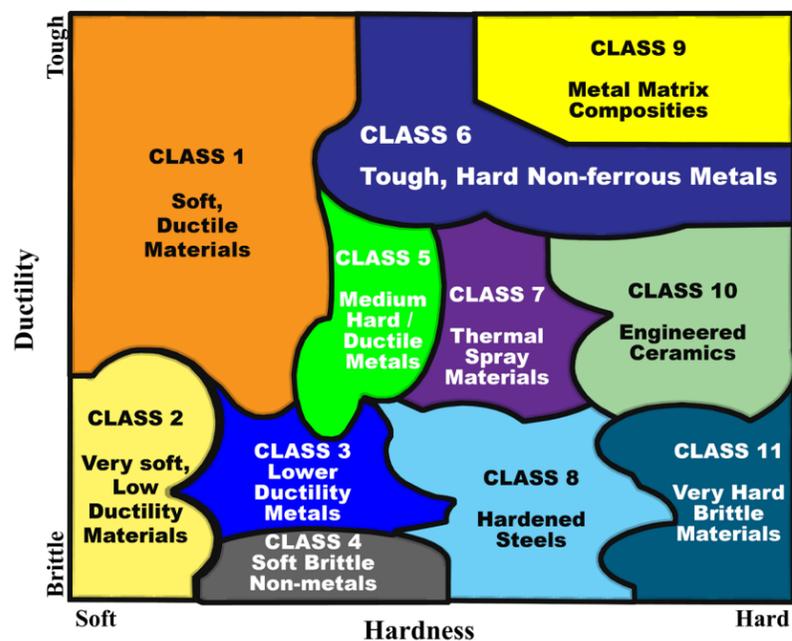
SAMPLE PREPARATION BASICS:

Metallographic specimen preparation requires a knowledge of the specimen properties, the most important characteristics being hardness and ductility of the metallographic specimen. Based on these material properties, the proper metallographic consumables and equipment parameters can be determined. The following charts plot the relative hardness and ductility for most metallographic materials.



SAMPLE PREPARATION CLASSES:

From this chart the hardness / ductility is categorized into eleven different classes. Each of these classes then represents a sample preparation method based on the mechanical properties of the material.



Class	Materials	Overview
CLASS 1	Soft, ductile materials (e.g. aluminum, copper, lead, tin, zinc, PMC's)	Relatively easy to prepare most materials in this Class with the use of alumina abrasives and 1-2 polishing steps
CLASS 2	Very soft, low ductility materials (e.g. rhenium, niobium, gold, silver)	Can be difficult to prepare because these materials are very soft and abrasives can become embedded into the specimen
CLASS 3	Low ductility metals (e.g. powder metals and cast irons)	Initial grinding with SiC abrasives is recommended, however, rough polishing must minimize pull-out
CLASS 4	Soft, brittle nonmetals (e.g. silicon, GaAs, electronic devices, ferrites)	Subsurface damage must be minimized in cutting, grinding and polishing of these materials. This requires the proper selection and application of the abrasive
CLASS 5	Medium hard, ductile metals (e.g. soft steels, stainless steels)	Relatively easy to prepare most materials in this Class with the use of SiC abrasives and 1-2 polishing steps
CLASS 6	Tough, hard, non-ferrous metals (e.g. super alloys, titanium)	Relatively easy to prepare most materials in this Class with the use of SiC abrasives and 1-2 polishing steps
CLASS 7	Thermal spray materials	Can pose significant preparation challenges depending upon the properties of the coating. See specific preparation procedures
CLASS 8	Hardened steels (e.g. high carbon and tool steels)	Relatively easy to prepare most materials in this Class with the use of SiC abrasives and 1-2 polishing steps
CLASS 9	Metal Matrix Composites	Very dependent upon both the matrix and filler materials properties. See specific preparation procedures
CLASS 10	Engineered Ceramics (e.g. zirconia, silicon nitride)	Successful preparation is typically accomplished with colloidal silica by CMP polishing
CLASS 11	Very hard, brittle materials (e.g. glass, minerals, CERMETS)	Minimize initial damage and use CMP polishing with colloidal silica abrasives



NANO-FEMTO-ZETA

PROCEDURE RECOMMENDATIONS

CLASS 1 - Ductile Materials

Examples include aluminum, copper, tin, lead, zinc and polymer matrix composites (PMC's).

Description:

CLASS 1 materials are relatively soft materials which have a wide range of industrial uses.

Preparation Challenges:

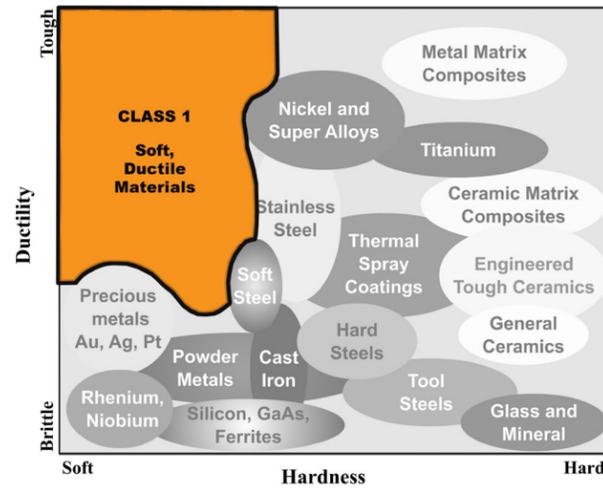
The difficulty in preparing these materials arises from the fact that these materials are very soft and often have oxide inclusions (aluminum and copper). Proper specimen preparation minimizes abrasive embedding and retains the specimen oxides, thus eliminating scratching and smearing. If the specimen is not prepared properly, the microstructure will not be accurately represented.

Sectioning:

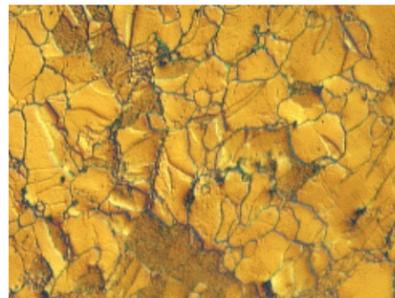
MAXCUT abrasive blade (MAX-C or MAX-E series)

Mounting:

Compression mounting with Phenolic, Epoxy or Diallyl Phthalate compression mounting resins



Abrasive / Surface	Lubricant	Force / sample	Speed (Head / base)	Time (minutes)	Dispenser (frequency / duration)	Individual Force Mode	Central Force Mode
P120 grit ALO paper P240 grit ALO paper	Water	5-10 lbs	100/100	Planar 1 min.	Off Off	N/A	
P500 grit ALO paper P1200 grit ALO paper	Water	5-10 lbs	100/100	1 min. 1 min.	Off Off		
1 micron DIAMAT diamond on ATLANTIS polishing pad	DIALUBE Purple Extender	5-10 lbs	100/100	2 min.	15 seconds / 3 seconds		
0.05 micron Nanometer alumina on NAPPAD polishing pad	-	5-10 lbs	100/100	1 min.	15 seconds / 5 seconds		



Pure zinc, 100X (DIC), Etchant 10 grams NaOH in 100 ml D.I. water for 5 seconds



Tough Pitch Copper, 100X (B.F.), Etchant NH4OH/H2O2 for 5 seconds

CLASS 2 - Very Soft, Ductile Materials

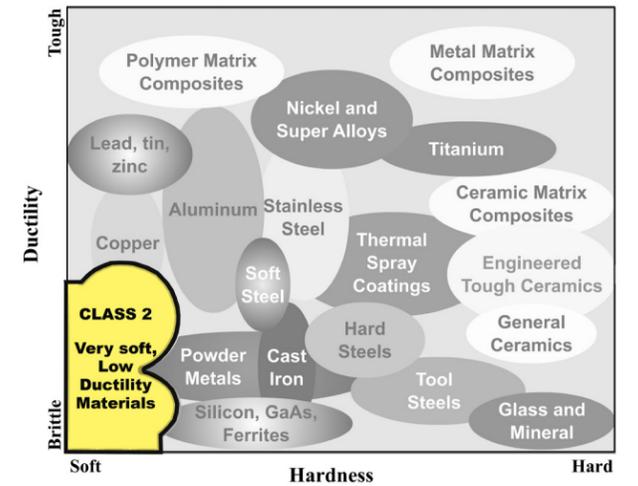
Examples include refractory metals (tungsten, rhenium, niobium, molybdenum), rare earths, precious metals.

Description:

CLASS 2 materials include refractory metals such as rhenium, niobium and tungsten which have very high melting temperatures; however, they are typically very soft and require the same specimen preparation considerations as other very soft metals.

Preparation Challenges:

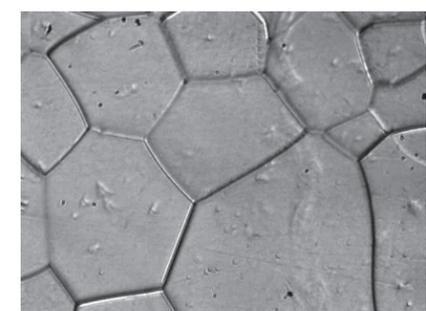
For very soft materials, any loose or fractured abrasive particles can become easily embedded. This makes specimen preparation very difficult because it gums up diamond grinding disks or the specimen can become embedded with fractured SiC particles when ground with SiC papers. The key to preparation of these materials is to use tougher alumina abrasives and to chemically etch the specimen in-between each grinding step. The purpose of etching is to remove the embedded particles so as not to carry them over to the next grinding step as contamination.



Abrasive / Surface	Lubricant	Force / sample	Speed (Head / base)	Time (minutes)	Dispenser (frequency / duration)	Individual Force Mode	Central Force Mode
P120 grit ALO paper P240 grit ALO paper	Water	5-10 lbs	100/100	Planar 1 min.	Off Off	N/A	
P500 grit ALO paper P1200 grit ALO paper	Water	5-10 lbs	100/100	1 min. 1 min.	Off Off		
1 micron DIAMAT diamond on ATLANTIS polishing pad	DIALUBE Purple Extender	5-10 lbs	100/100	2 min.	15 seconds / 3 seconds		
0.05 micron Nanometer alumina on MICROPAD polishing pad	-	5-10 lbs	100/100	1 min.	15 seconds / 5 seconds		



99.9% Silver, etched with ammonia peroxide, 200X B.F



Rhenium (BF), etched

PROCEDURE RECOMMENDATIONS

CLASS 3 - Lower Ductility Metals

Examples of lower ductility metals include powder metals and cast iron.

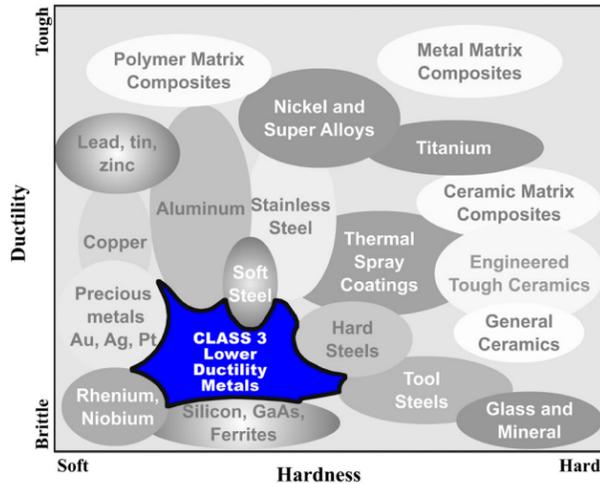
Description:

Powder metallurgy is an example of a CLASS 3 low ductility materials which is a very useful manufacturing process for parts designed with hard-to-machine geometries. The process includes pressing a metal powder into its shape and then sintering it just below the melting temperature of the alloy.

Preparation Challenges:

The metallographic specimen preparation of powder metallurgy samples is affected by the specimen's composition, packing and sintering conditions. Microstructural features of interest include: porosity, grain size, inclusions and orientation of voids. Proper metallurgical preparation takes into account that the microstructure may be porous and perhaps somewhat brittle due to inadequate sintering conditions.

Vacuum impregnation is often used to support voids and porosity before initial grinding. In addition, metal smeared into pores can be removed by an intermediate etch in-between polishing steps.



CLASS 4 - Soft, Brittle Nonmetals (Electronics)

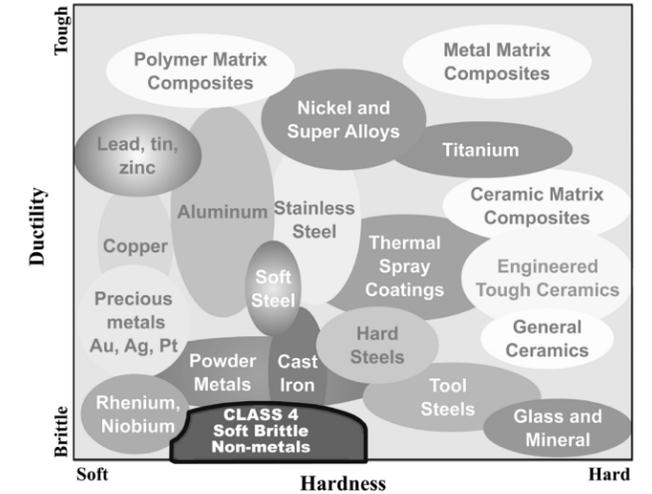
Examples include ceramic capacitors, silicon, GaAs, ferrites, PZT's, MEMS devices.

Description:

Ceramic capacitors are an example of a CLASS 4 softer more brittle types of material. These materials are typically very small, inexpensive devices used in cell phones, computers and other electronic products. MLC devices are constructed of alternating layers of metal and ceramic, with the ceramic material acting as the dielectric.

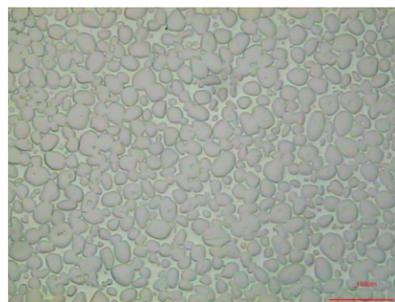
Preparation Challenges:

Microstructural analysis of a BaTiO3 ceramic capacitor includes looking for missing metal layers, as well as examining for gaps and voids in the ceramic substrate. Microstructural preparation of multi-layer BaTiO3 ceramic capacitors requires minimizing polishing relief and damage to the coating or ceramic substrate. This is accomplished by filling the existing voids with a castable resin under vacuum and then curing at a higher pressure. Initial grinding is required to open up the capacitor. The goal is to minimize microstructural damage at this step. Rough and final polishing are recommended on woven polishing pads using diamond and colloidal silica, respectively.

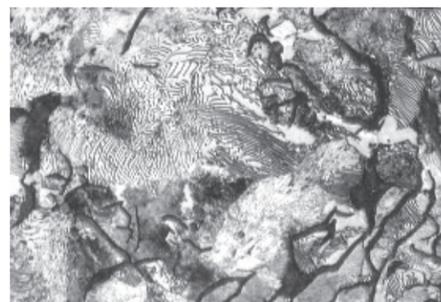


Abrasive / Surface	Lubricant	Force / sample	Speed (Head / base)	Time (minutes)	Dispenser (frequency / duration)	Individual Force Mode	Central Force Mode
120 grit SiC paper 240 grit SiC paper	Water	5-10 lbs	200/200	Planar 1 min.	Off Off	N/A	
360 grit SiC paper 600 grit SiC paper 800 grit SiC paper 1200 grit SiC paper	Water	5-10 lbs	200/200	1 min. 1 min. 1 min. 1 min.	Off Off Off Off		
1 micron DIAMAT diamond on GOLDPAD polishing pad	DIALUBE Purple Extender	5-10 lbs	200/200	2 min.	15 seconds / 3 seconds		
0.05 micron Nanometer alumina on TRICOTE polishing pad	-	5-10 lbs	100/100	30 sec.	15 seconds / 5 seconds		

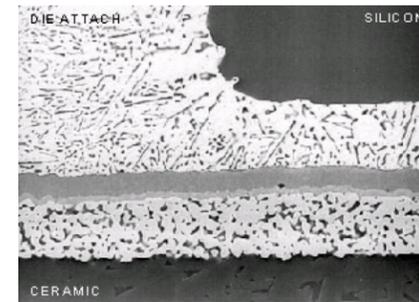
Abrasive / Surface	Lubricant	Force / sample	Speed (Head / base)	Time (minutes)	Dispenser (frequency / duration)	Individual Force Mode	Central Force Mode
30 micron Diamond Film 15 micron Diamond Film	POLYLUBE Diamond Extender	5-10 lbs	200/200	Planar 3 min.	Off Off	N/A	
9 micron Diamond Film 6 micron Diamond Film 3 micron Diamond Film	POLYLUBE Diamond Extender	5-10 lbs	200/200	2 min. 2 min. 2 min.	Off Off Off		
1 micron DIAMAT diamond on ATLANTIS polishing pad	DIALUBE Purple Extender	5-10 lbs	200/200	1 min.	15 seconds / 3 seconds		
MICROPAD polishing pad	Colloidal Silica	5-10 lbs	200/200	30 sec.	15 seconds / 5 seconds		



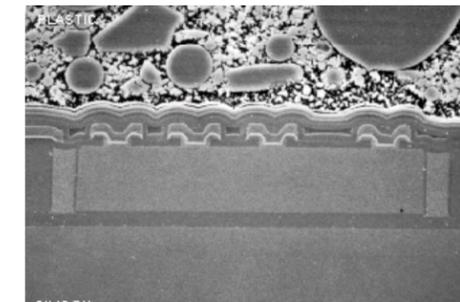
Tungsten refractory metal, 200X (DIC), etched with Murakami's reagent



Graphite cast iron, 2% nital etchant, 500X



Electronic die cross section



Electronic die cross section

PREPARATION GUIDELINES (CLASS 3)

PREPARATION GUIDELINES (CLASS 4)

PROCEDURE RECOMMENDATIONS

CLASS 7 - Thermal Spray Materials

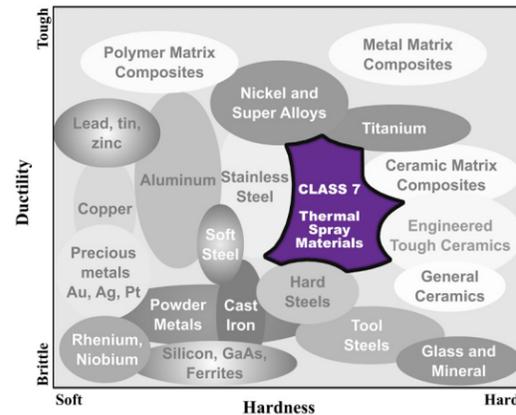
Examples include powder spray coatings, ceramic coatings, intermetallic coatings.

Description:

CLASS 7 Thermal spraying techniques are coating processes in which melted (or heated) materials are sprayed onto a surface. Thermal spraying can provide various coating thicknesses (20 microns to several mm) over a large area. Coating materials available for thermal spraying include metals, alloys, ceramics, plastics and composites.

Preparation Challenges:

Metallographic preparation of thermal spray coatings can be tricky; however, minimizing damage and understanding the chemical and mechanical properties of the coating and substrate will greatly improve successful specimen preparation. Note for WC-Co coatings, the cobalt is reactive with water so final polishing with 0.25 micron diamond replaces traditional alumina water based suspensions/slurries.



CLASS 8 - Hardened Steels

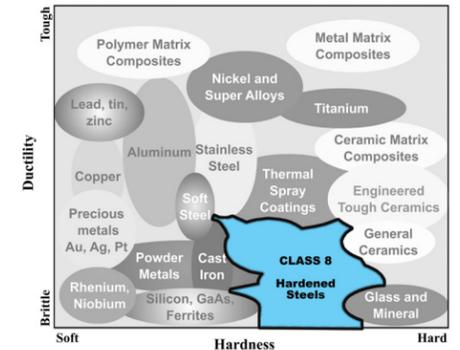
Examples include case hardened steels, tool steels, and through-hardened steels.

Description:

CLASS 8 Iron and steels play an important role in the world of structural and mechanical metals. Steel, in particular, is very useful because its hardness, wearability and toughness can be altered significantly by heat treating and annealing processes. Tool steels have high hardness ($R_c > 60$) and generally are used with alloying metals such as vanadium, molybdenum and manganese.

Preparation Challenges:

Metallographic specimen preparation is relatively straight forward.

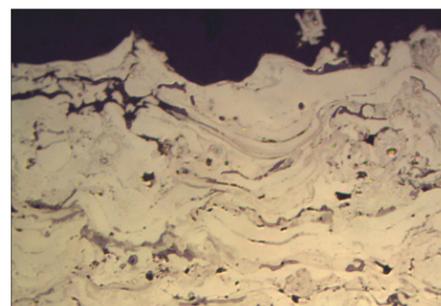


Abrasive / Surface	Lubricant	Force / sample	Speed (Head / base)	Time (minutes)	Dispenser (frequency / duration)	Individual Force Mode	Central Force Mode
240 grit SiC paper	Water	5-10 lbs	200/200	Planar	Off	N/A	
320 grit SiC paper 400 grit SiC paper 600 grit SiC paper 800 grit SiC paper 1200 grit SiC paper	Water	5-10 lbs	200/200	1 min. 1 min. 1 min. 1 min. 1 min.	Off Off Off Off Off		
3 micron DIAMAT diamond on GOLDPAD polishing pad	DIALUBE Purple Extender	5-10 lbs	200/200	2 min.	15 seconds / 3 seconds		
1 micron DIAMAT diamond on ATLANTIS polishing pad	DIALUBE Purple Extender	5-10 lbs	200/200	2 min.	15 seconds / 3 seconds		
0.05 micron Nanometer alumina on MICROPAD polishing pad	Vibratory Polishing			15-30 minutes			

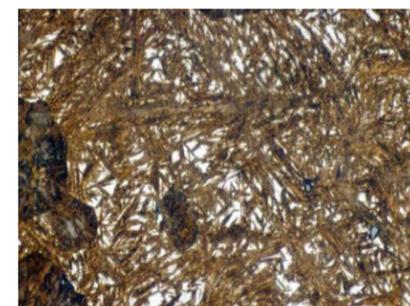
Abrasive / Surface	Lubricant	Force / sample	Speed (Head / base)	Time (minutes)	Dispenser (frequency / duration)	Individual Force Mode	Central Force Mode
120 grit SiC paper 240 grit SiC paper	Water	5-10 lbs	300/300	Planar 1 min.	Off Off	N/A	
360 grit SiC paper 600 grit SiC paper	Water	5-10 lbs	300/300	1 min. 1 min.	Off Off		
9 micron DIAMAT diamond on POLYPAD polishing pad	DIALUBE Purple Extender	5-10 lbs	300/300	3 min.	15 seconds / 3 seconds		
6 micron DIAMAT diamond on TEXPAN polishing pad	DIALUBE Purple Extender	5-10 lbs	300/300	3 min.	15 seconds / 3 seconds		
1 micron DIAMAT diamond on GOLDPAD polishing pad	DIALUBE Purple Extender	5-10 lbs	300/300	3 min.	15 seconds / 3 seconds		
0.05 micron Nanometer alumina on NAPPAD polishing pad	-	5-10 lbs	200/200	30 sec.	15 seconds / 5 seconds		



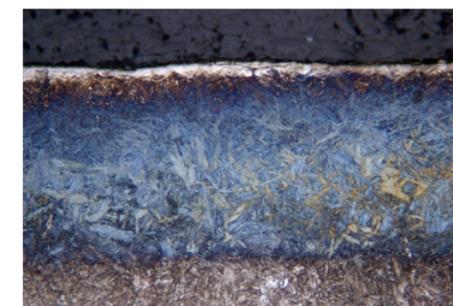
Nickel Chrome Thermal Spray Coating, as polished, Mag 1000x (B.F.)



Nickel-Aluminum Thermal Spray Coating, as polished, Mag 500x (B.F.)



1095 Steel, Water Quenched, etched with Picral, 1000X B.F. Martensite structure



Nitrided steel, 200X (BF), Etchant Picral

PROCEDURE RECOMMENDATIONS

CLASS 9 - Metal Matrix Composites

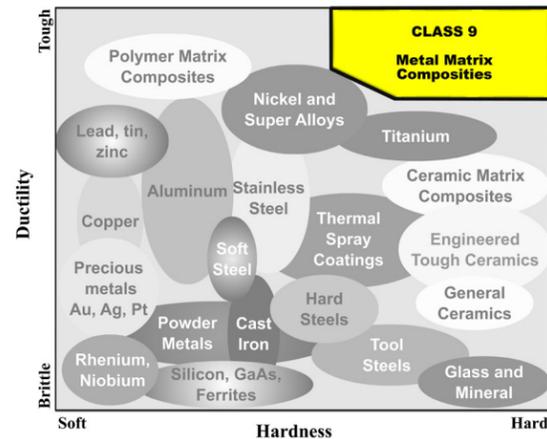
Examples include ceramic fibers in a metal matrix and/or ceramic particles in a metal matrix.

Description:

CLASS 9 Metal matrix composite applications have been found in high performance sporting goods and high performance military applications. They are primarily used to combine the hardness and energy absorbing characteristics of the ceramic with the bonding and ductility characteristics of the metal.

Preparation Challenges:

Hard particles in a metal matrix can be difficult to microstructurally prepare because of particle pull-out, as well as excessive polishing relief between the hard particles and the softer matrix.



CLASS 10 - Engineered Ceramics

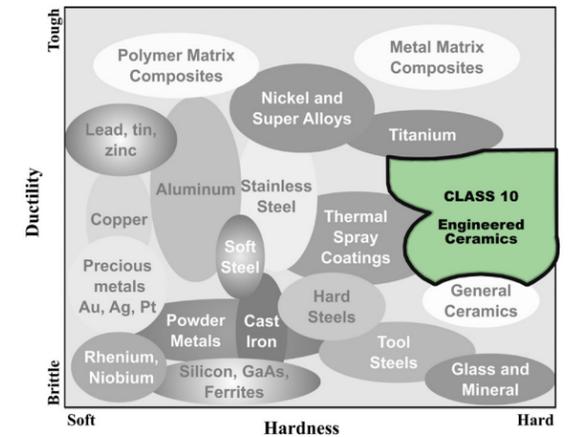
Examples include silicon nitride, zirconia, SiSiC, silicon carbide, boron carbide, alumina and ceramic matrix composites

Description:

CLASS 10 Engineered ceramics have found increasing applications for high temperature, corrosion resistance, low wearability and a number of other applications. An example of a CLASS 10 specimen preparation technique is for aluminum oxynitride (AlON) which is a ceramic composed of aluminum, oxygen and nitrogen. It is a semi-transparent ceramic that is harder than glass.

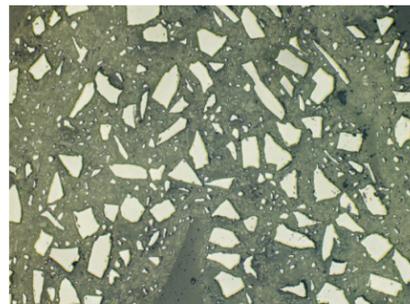
Preparation Challenges:

Engineered ceramics are very hard therefore specimen preparation procedures generally require a CMP (chemical mechanical polishing) component to remove induced microstructural damage. When examining the surface, it is recommended that a sputter coating be used to increase surface reflectivity.

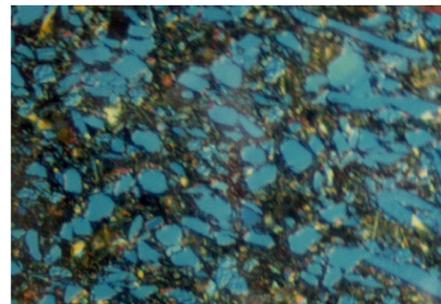


Abrasive / Surface	Lubricant	Force / sample	Speed (Head / base)	Time (minutes)	Dispenser (frequency / duration)	Individual Force Mode	Central Force Mode
75 micron diamond grinding disk	Water	5-10 lbs	300/300	Planar	Off	N/A	
30 micron DIAMAT diamond suspension on CERMESH Metal Mesh cloth	-	5-10 lbs	300/300	5 min.	15 seconds / 3 seconds		
9 micron DIAMAT diamond on POLYPAD polishing pad	DIALUBE Purple Extender	5-10 lbs	300/300	5 min.	15 seconds / 3 seconds		
3 micron DIAMAT diamond on GOLDPAD or ATLANTIS polishing pad	DIALUBE Purple Extender	5-10 lbs	300/300	5 min.	15 seconds / 3 seconds		
SIAMAT Colloidal silica on TEXPAN polishing pad	-	5-10 lbs	300/300	5 min.	15 seconds / 3 seconds		

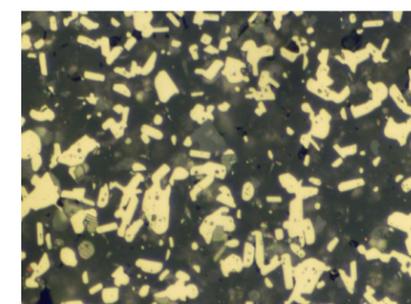
Abrasive / Surface	Lubricant	Force / sample	Speed (Head / base)	Time (minutes)	Dispenser (frequency / duration)	Individual Force Mode	Central Force Mode
75 micron diamond grinding disk	Water	5-10 lbs	300/300	Planar	Off	N/A	
30 micron DIAMAT diamond suspension on CERMESH Metal Mesh cloth	-	5-10 lbs	300/300	5 min.	15 seconds / 3 seconds		
6 micron DIAMAT diamond on TEXPAN polishing pad	SIAMAT colloidal silica	10 lbs	300/300	5 min.	15 seconds / 3 seconds		
1 micron DIAMAT diamond on GOLDPAD or ATLANTIS polishing pad	SIAMAT colloidal silica	10 lbs	300/300	5 min.	15 seconds / 3 seconds		
SIAMAT Colloidal silica on TEXPAN polishing pad	-	10 lbs	300/300	5 min.	15 seconds / 3 seconds		



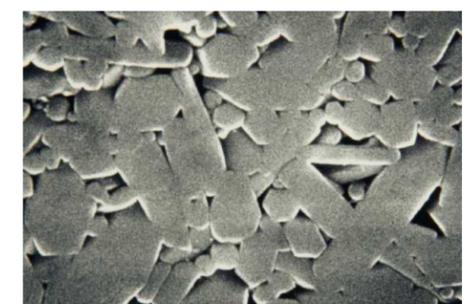
SiC particles in an Aluminum Matrix, 400X (DIC)



Zirconium Diboride particles in a Titanium Matrix Etched, 1000X (DIC)



AlON ceramic, B.F. 1000x (as polished)



SiAlON ceramic, etched in molten KOH, Mag 20 KX

CLASS 11 - Very Hard Hard Brittle Materials & CERMETS

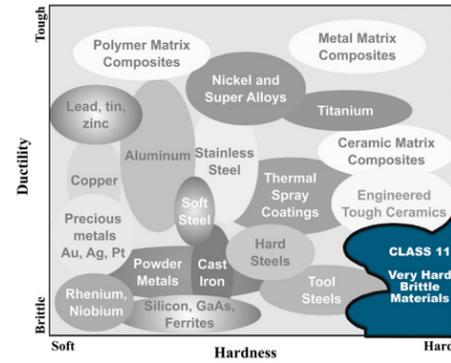
Examples include cermets such as tungsten carbide, glass and minerals.

Description:

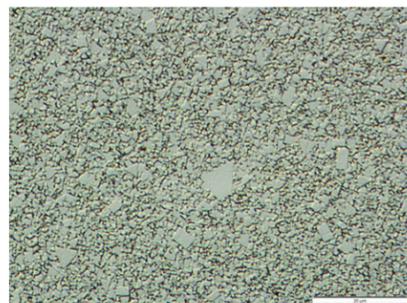
CLASS 11 CERMETS, glass and minerals are typically very hard. CERMETS are typically very wear resistant and very tough materials, whereas minerals and glass tend to be more brittle.

Preparation Challenges:

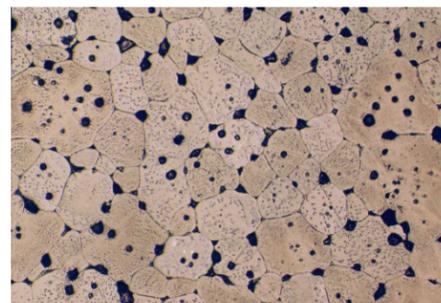
The key to proper specimen preparation of CERMET materials such as tungsten carbide is to grind with a semi-fixed abrasive (polycrystalline diamond on a metal mesh cloth), followed by combining diamond abrasives with a CMP (chemical mechanical polishing) abrasive such as SIAMAT™ colloidal silica.



Abrasive / Surface	Lubricant	Force / sample	Speed (Head / base)	Time (minutes)	Dispenser (frequency / duration)	Individual Force Mode	Central Force Mode
75 micron diamond grinding disk	Water	5-10 lbs	300/300	Planar	Off	N/A	
30 micron DIAMAT diamond suspension on CERMESH Mesh cloth	-	5-10 lbs	300/300	5 min.	15 seconds / 3 seconds		
9 micron DIAMAT diamond on POLYPAD polishing pad	DIALUBE Purple Extender	5-10 lbs	300/300	5 min.	15 seconds / 3 seconds		
3 micron DIAMAT diamond on GOLDPAD or ATLANTIS polishing pad	DIALUBE Purple Extender	5-10 lbs	300/300	5 min.	15 seconds / 3 seconds		
SIAMAT Colloidal silica on TEXPAN polishing pad	-	5-10 lbs	300/300	5 min.	15 seconds / 3 seconds		



Tungsten carbide, 2000X (DIC), etched with 50% HNO₃ and 50% HCl



Periclase, 200X (B.F.) Thermal etching at 1200 Celsius for 2 hours

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IM-7000 Premium Microscope
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PICO-200A Automatic Table Saw
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PICO-200S Manual Table Saw
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